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Number 5.

FEBRUARY, 1904.

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TEXTILE WORLD RECORD

LORD & NAGLE COMPANY · Boston & Philadelphia

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The Annual Official Directory for the Year 1904, is Now in Preparation.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

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Washers, Squeezers,

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Rusden Patent

Continuous Chainless

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Aniline Agers,

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Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

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Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

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DRYING

AND

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Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

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ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, drawings and full particulars of complete plants furnished on application

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OF

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Patented in the United States, Great Britain and the Continent
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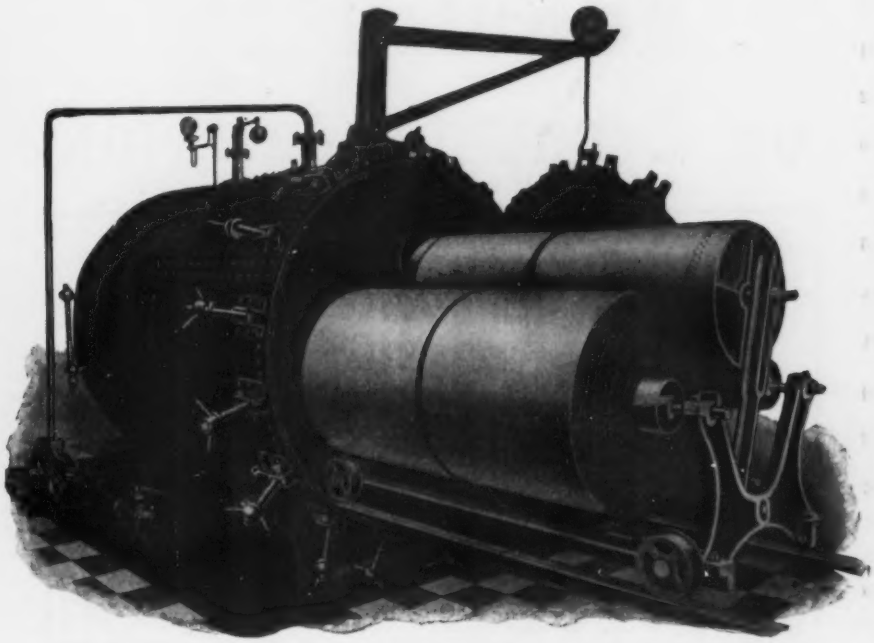

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Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

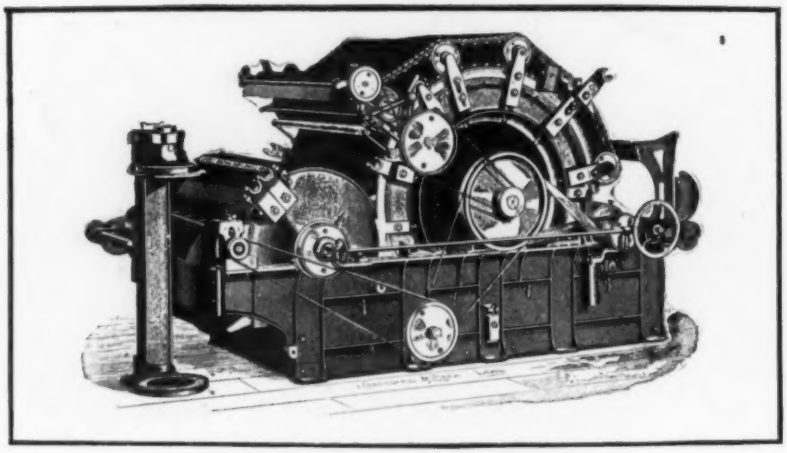
YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States

Cotton and Worsted Machinery

OF EVERY DESCRIPTION



Revolving Flat Top Card

Simple in Design and Construction. Durable in Operation. Maximum Carding with Minimum Waste. Improvements are added only after several years' trial, thus saving our customers and ourselves many annoyances which others have experienced. Workmanship a Leading Characteristic.

Lowell Machine Shop

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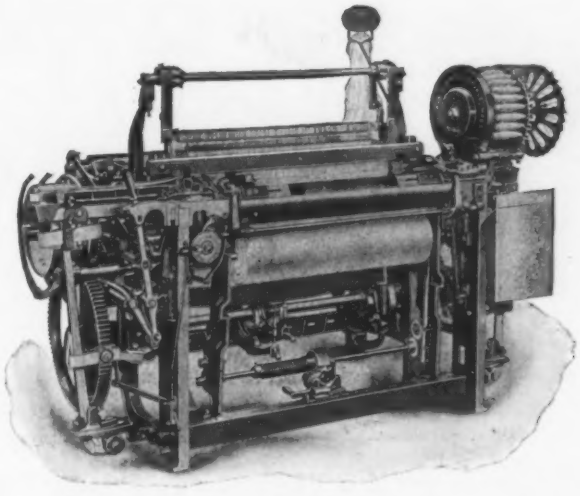

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DESIGNED exclusively for Print Cloths and similar light fabrics. Will weave without a thick or a thin place. Can bang off without shock. Has the large hopper, the Draper-Roper let-off, a new take-up and a new warp stop knock-off.

Large orders now being filled by the

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OUR LATEST!

AUTOMATIC FILLING STOP MOTION

This attachment will positively stop the loom just before filling runs out, leaving absolutely no mispicks, and it can be attached to any loom.

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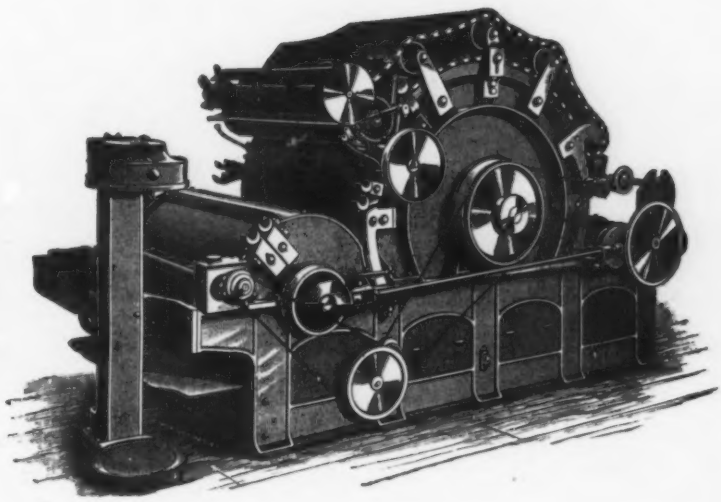

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Plain and Fancy Silk Looms

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THE

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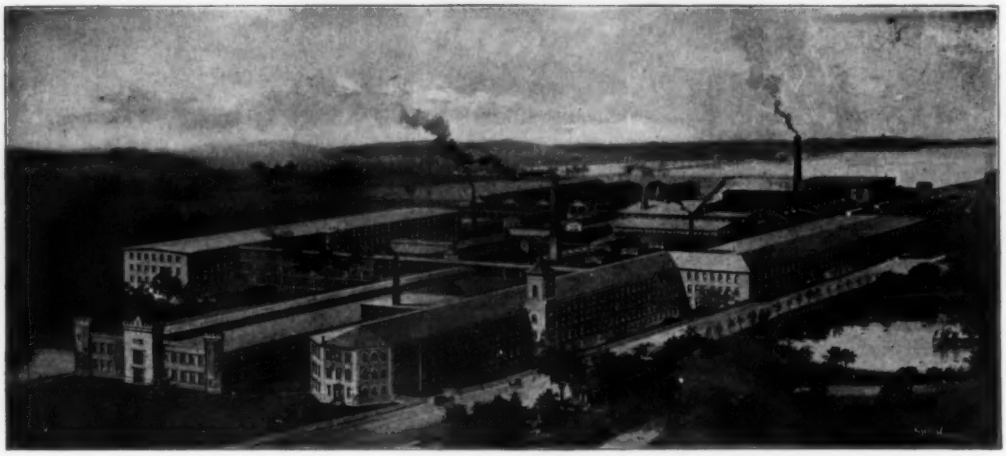

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Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
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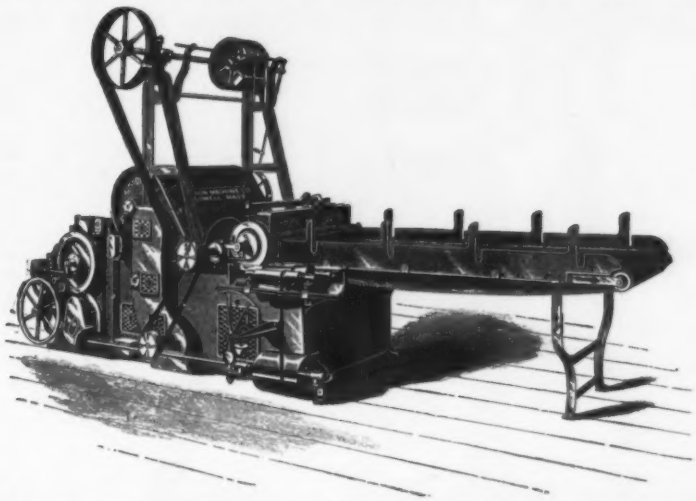
The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

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LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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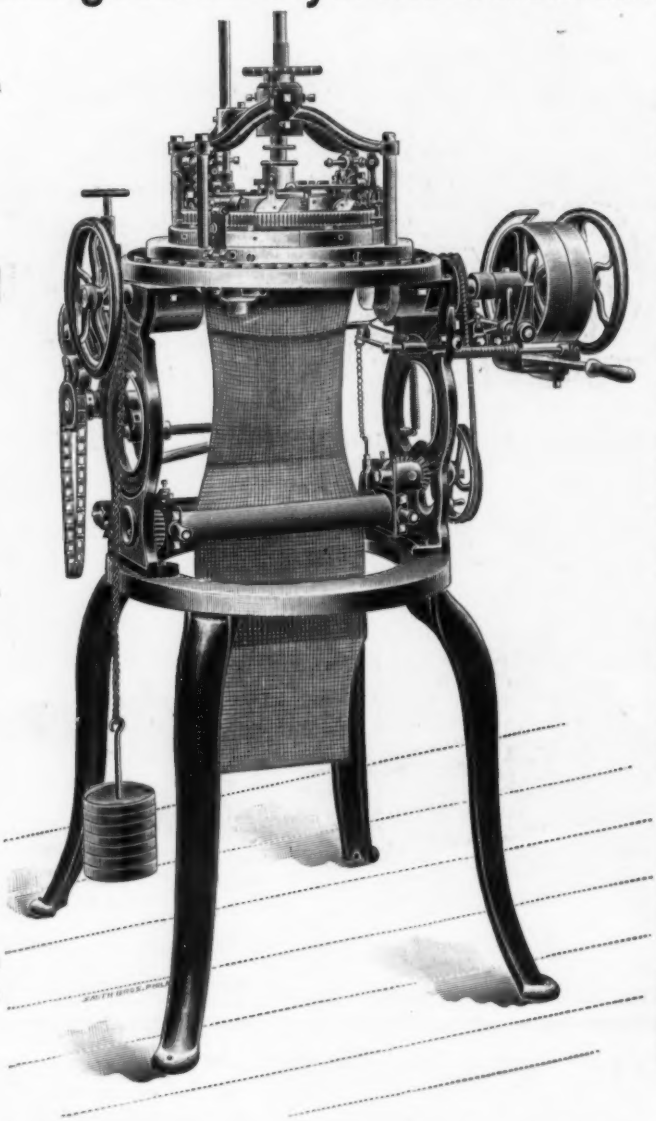
Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

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BUILDERS OF

KNITTING MACHINERY

Hand or Power, Open Top or Hold Down.

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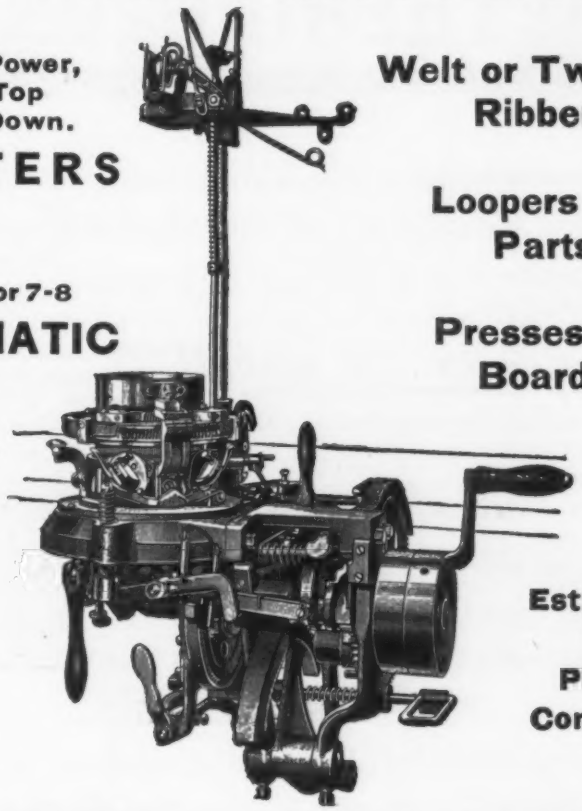
AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



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Estimates for Plants Complete.

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Hand Forged Steel Cylinders.

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Our Fire-Proof Metal Mule Carriage

reduces the danger from fire in the mule head to a minimum, and makes

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Our new Comber is selling beyond anticipations, 300 are now working and giving entire satisfaction.

None better in the world! The opinion of Thomas Ashton, England's great labor leader and member of the British Labor Commission, of the Mule Room at the Soule Mill, New Bedford, Mass., to the "Evening Standard" reporter on Nov. 25, 1902.

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Cards, Drawing, Slubbing, Intermediate and Roving Frames.

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Improved Heilman Combers. Over 4,000 running in U. S. A.

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Platt's Special Machinery for Making French Worsted Yarns.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.

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Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

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Flax, Hemp and Jute Machinery.

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Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

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Looms for Worsteds, etc.

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The best French and English Combing and Rubbing Aprons.
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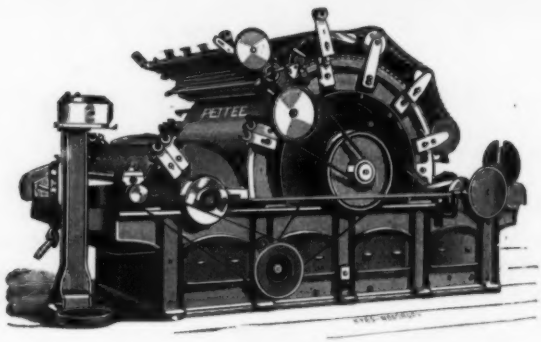

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REVOLVING FLAT CARDS,
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INTERMEDIATE AND ROVING FRAMES,
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Increases Production,
Improves Quality,
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THE BRAMWELL FEEDER (over 12,000 now in use.)
For Woolen, Worsted, Shoddy and Hosiery CARDS and GARNETT Machines.

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For Second Breaker and Finisher CARDS.

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For Burr and Mixing Pickers, also Fearnaughts.

THE NEW 1902 BRAMWELL OPENER AND FEEDER,
A Complete Machine. For Wool Washers and Wool Dryers.

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A NEW CLUTCH ATTACHMENT FOR BRAMWELL FEEDERS,
Positive and Durable.

A FULL LINE OF PINS AND PARTS FOR LAMAIRE FEEDS.

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Absolute Combustion of Soft Coal in Steam Boiler Furnaces. . . . NO SMOKE!

Saves Fuel.

Flues and Sheets Always Clean.

Gives Higher Evaporation.

Burns Any Kind of Fuel.

Low in First Cost.

Repairs Nominal and Easily Made.

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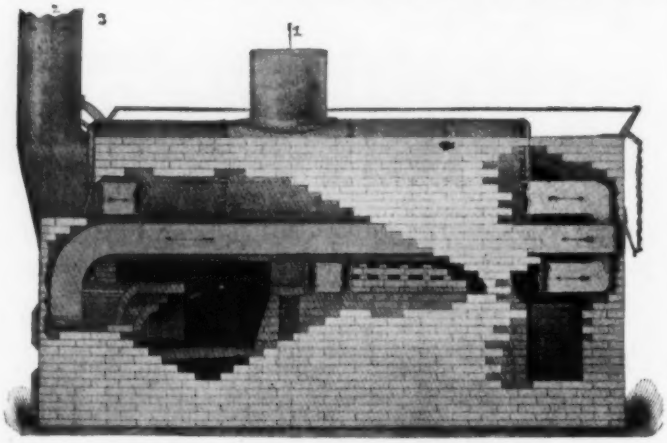

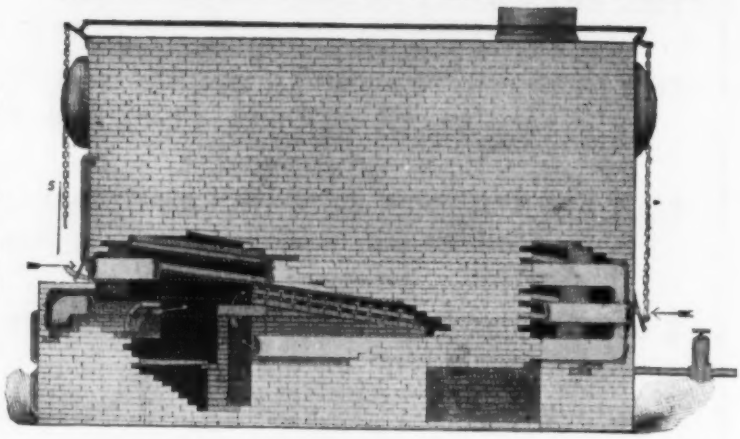

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W. G. & G. GREENFIELD, Greenfield Steam Engine Works, 5th and Cross Streets, EAST NEWARK, N. J.
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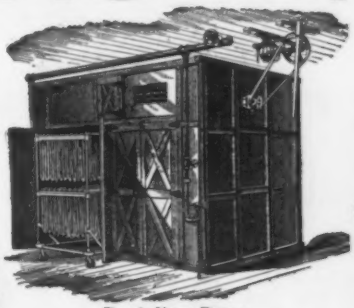
J. B. HARRIS, M.D., Inventor and Patentee,
71 Arcade, NASHVILLE, TENN.

"HURRICANE" DRYERS AND FANS

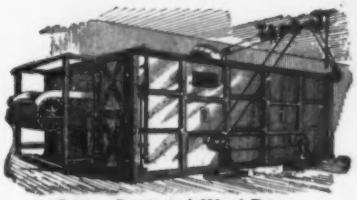
For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.



Truck Yarn Dryer.

Write for Booklets.

"Hurricane" Fan, Style No. 2.



Cotton Stock and Wool Dryer.

MACHINERY FOR
BLEACHING
AND
CARBONIZING

PHILADELPHIA DRYING MACHINERY CO.

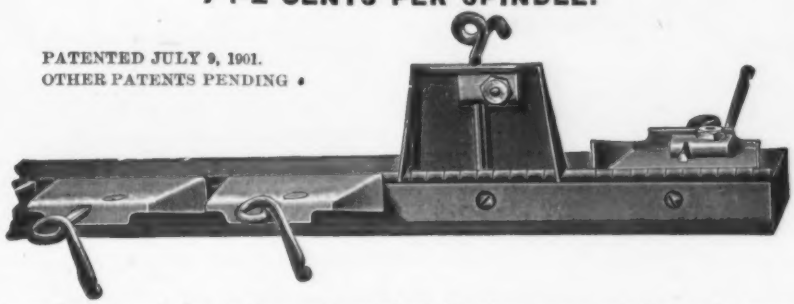
6721 Germantown Ave., Philadelphia, Pa.

HOUGHTON'S
ALL STEEL THREAD BOARD

with Hardened Thread Guides.

7 1-2 CENTS PER SPINDLE.

PATENTED JULY 9, 1901.
OTHER PATENTS PENDING.



The only Thread Board that *holds a guide solid* all the time; *never* gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles, and have been proven true by actual use in many mills whose superintendents will substantiate these claims.

L. T. HOUGHTON, Sole Manufacturer, WORCESTER, MASS.

THE

A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

The Leading Manufacturers of

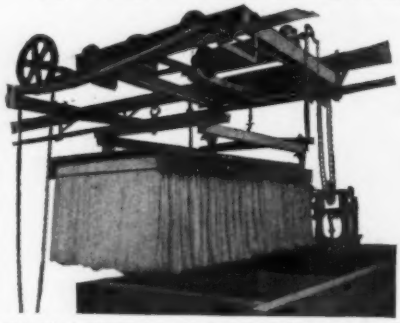
PREPARATORY COTTON MACHINERY

The Hussong Dyeing Machine

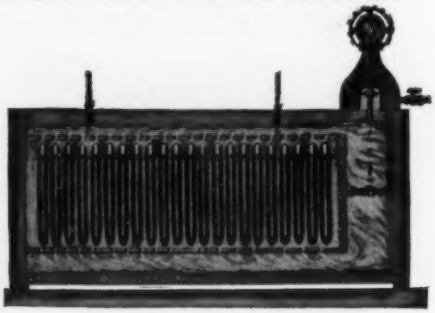
Patented Nov. 6, 1900. April 9, 1901.

For Dyeing both Alizarine and Acid Colors on Yarn.

A PERFECT SKEIN DYEING MACHINE.



This illustration shows our Compressed Air Hoisting Carriage, with 300 pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

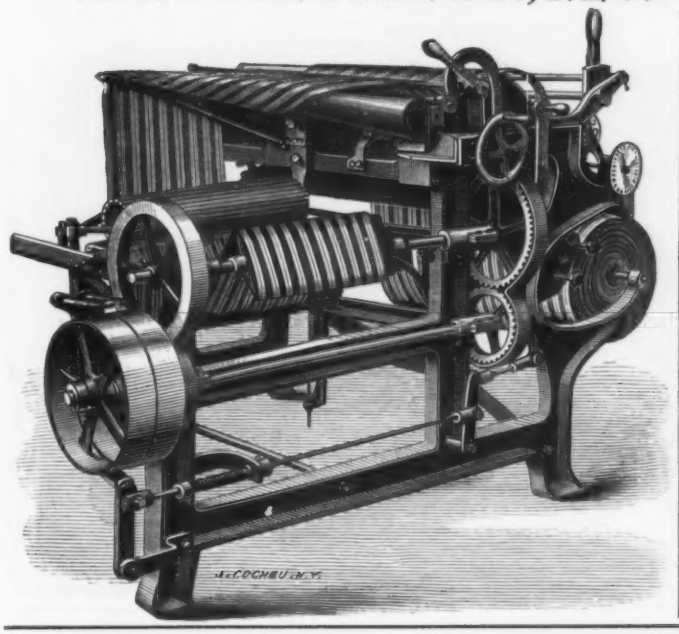
Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor, Makes No Waste Whatever, No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the AMERICAN DYEING MACHINE COMPANY, Office 609 Pearl St., Camden, N. J.

Reference Given on Application.

Fabric Measuring & Packaging Co.

82 & 84 CENTRE ST., NEW YORK, U.S.A.



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On Cottons, Woolens and Carpets.

Machines to Measure

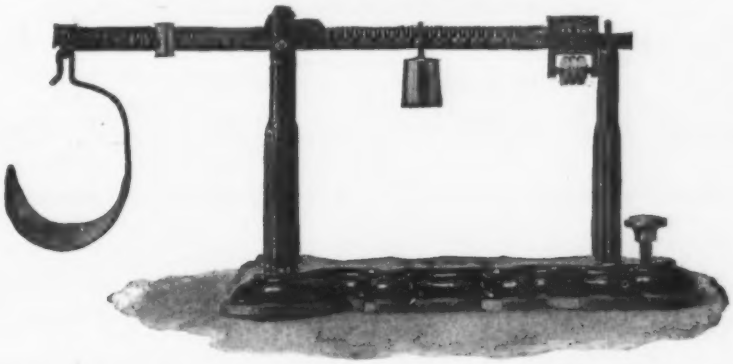
and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

A ROVING or YARN SCALE

That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



WITH THE WEIGHTS ALL ON THE BEAM. NO LOST WEIGHTS WITH THIS SCALE.

One of the most sensitive scales made. Positive and accurate. Send for prices.

SWEET & DOYLE,

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KNITTING MILL SUPPLIES.

☞We make scales of every description.

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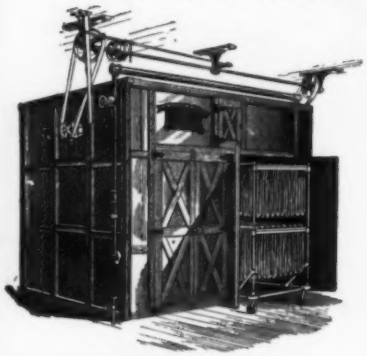
"20th Century" Drying Machines

FOR WOOL, COTTON, STOCK, YARNS, HOSIERY AND UNDERWEAR.



TRUCK YARN DRYER.

Carbonizing Plants Complete;
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Ventilating Fans, Etc.

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LAWSON BRANCH,

Hope Foundry. LEEDS. England.

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,
LONG REACH SCREW-GILL DRAWING FRAMES,
CHAIN-GILL DRAWING FRAMES with Apron Head,
PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,
AND OTHER
Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

UNIVERSALLY RECOGNIZED

AS THE GREATEST EXPENSE REDUCER KNOWN. THE

Cross Oil Filter

Is Guaranteed to SAVE ½ THE COST OF OIL.

Send to-day for the CROSS OIL FILTER
on 30 days' trial.
If unsatisfactory return at our expense.

THE CUMMER LUMBER CO., JACKSONVILLE, FLA., SAY OF THE CROSS OIL FILTER, "THEY REFINE OIL AS CLEAN AS WHEN NEW."

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SUPPLIED ALSO BY OIL COMPANIES, ENGINE BUILDERS AND POWER CONTRACTORS.

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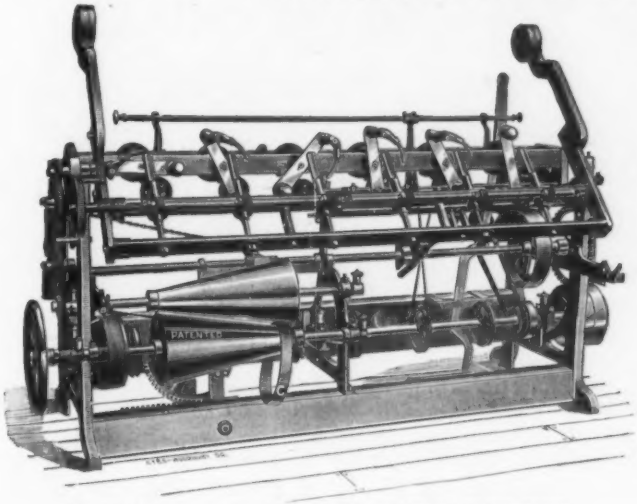
Successors to SILVER & GAY CO.



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BALLING MACHINES,
QUILLERS,
REELS,
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AND
SPECIAL COTTON
MACHINERY.

SPECIAL — AUTOMATIC BALL WINDER.
Adapted to All Kinds of Twines, Silks and Floss.

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ALBERT BIRCH,
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TEXTILE FINISHING MACHINERY

WORKS ON LINE OF FITCHBURG RAILROAD
No connection with any other concern. Our only place of business for 15 years is at
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to which place please address your enquiries.

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SOMERVILLE MACHINE WORKS,

WOOLEN and WORSTED FINISHING MACHINERY

And also for

BLEACHING, DYEING, DRYING and FINISHING COTTON GOODS.

Send for Circulars and Prices.

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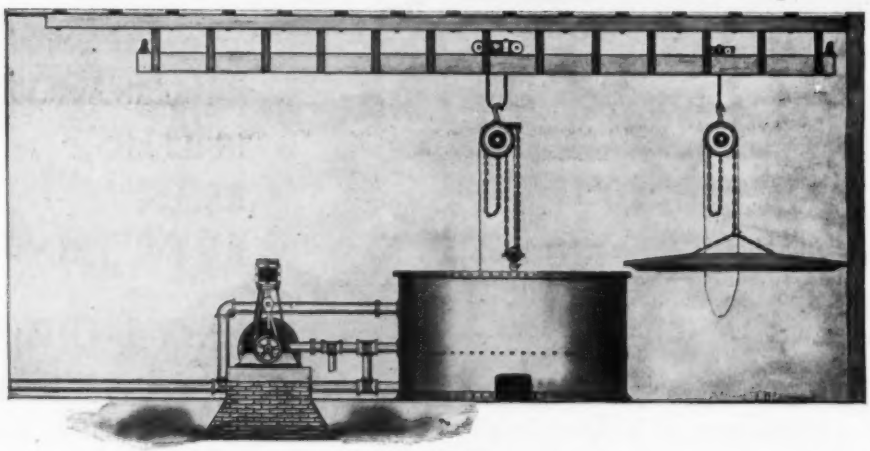
VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY **DYEING MACHINES**



Established 1866.

EAGLE AND PHENIX MILLS, COLUMBUS, GA., June 19, 1903.

VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: In reply to your inquiry as to the operations of the raw stock dyeing machine which we recently purchased from you, beg to say we have had this in operation now about a week and have given it, we think, a very thorough and exhaustive test, and so far are very much pleased with its operations. It is substantially built, we think the principle is entirely correct, its capacity is very ample, and we think will prove to be exactly the machine we have been looking for.

We congratulate you upon the apparent success of the machine.

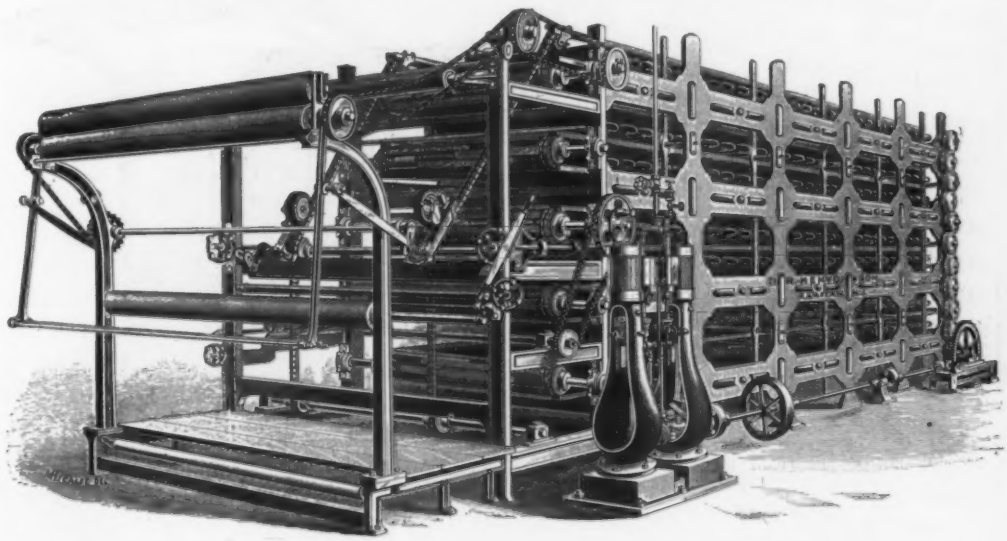
We are, yours very truly,
G. GUNBY JORDAN, President.

The machine has been in continuous and successful operation since the above date.

Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs, (double or single,) Dewing Machines, etc.

MANUFACTURED BY

D. R. KENYON & SON,

SUCCESSORS TO KENYON BROS.

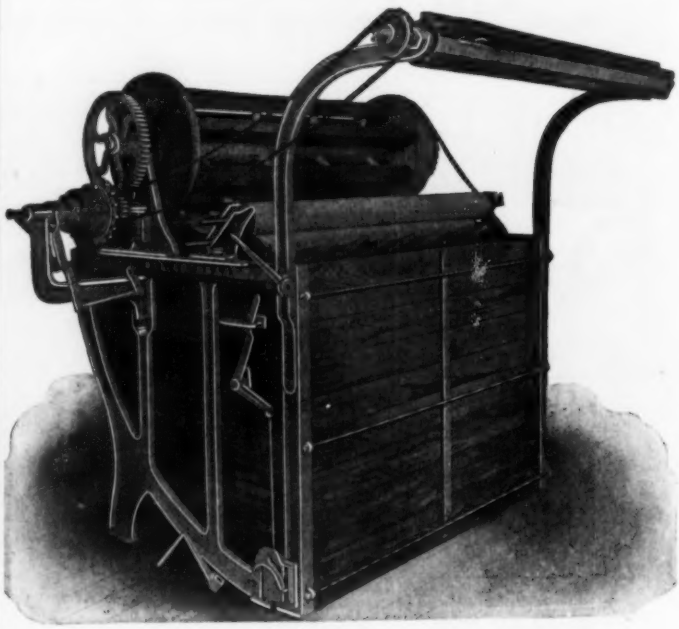
Long Distance Telephone, Somerville 40-B.

RARITAN, N. J.

RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
Rotary Cloth Washers.
Rotary Knit Goods Washers.
Combined R'y Fulling Mill and Washer for Knit Goods.
Endless Felt R'y Washers and Rotary Felling Mills.
Hammer Falling Stocks.
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines for Chloride of Lime and Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

New Dyeing Machine



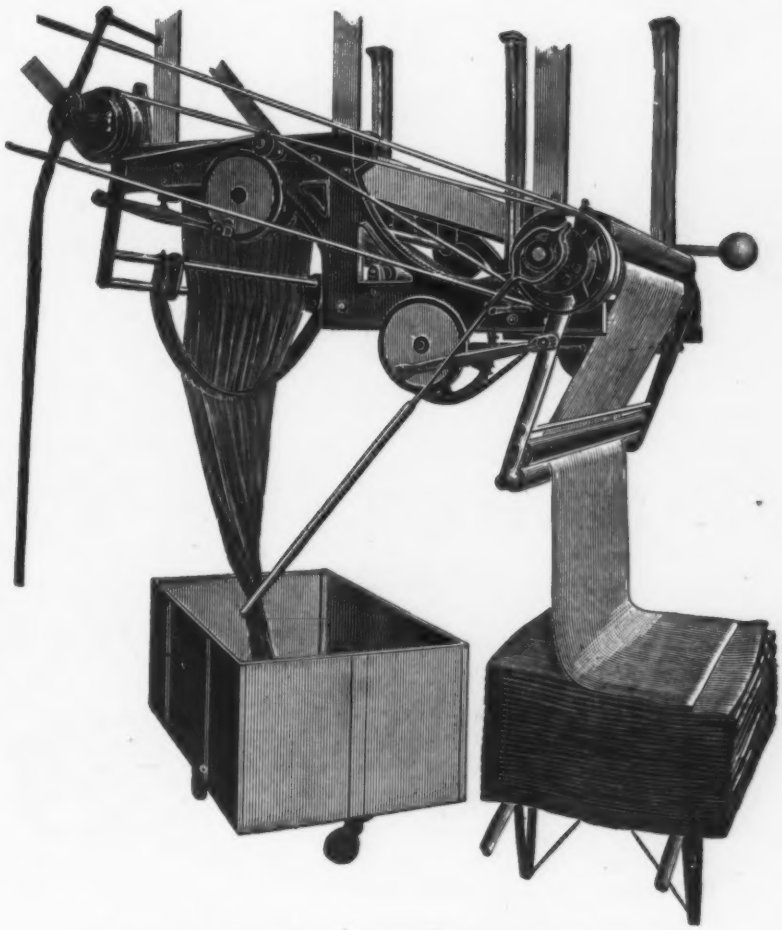
TYPE L. FOR CLOTH AND KNIT GOODS IN THE PIECE.

TYPE M. FOR BLEACHING COTTON KNIT GOODS, CIRCULAR No. 16.

Boston Office,
70 KILBY STREET,
Telephone No. 1522.

Main Office and Works,
ORANGE, MASS.

The Hunter CLOTH OPENER AND FOLDER



ONE MAN CAN OPEN AND FOLD MORE GOODS IN A DAY WITH THIS MACHINE THAN FOUR MEN CAN DO BY HAND.

No stretching or beating of goods under tension. All the parts coming in contact with cloth are brass or wood.

Opens any width of cloth from 63 inches down to 30 inches. Can be built wider for blankets.

James Hunter Machine Co., North Adams, Mass.

You Want the Best. We Build Them.

CLOTH WASHERS, FULLING MILLS,

1901 FULLING MILL.

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

HOPKINS MACHINE WORKS

Providence and Bridgeton, R. I.

PROVIDENCE OFFICE

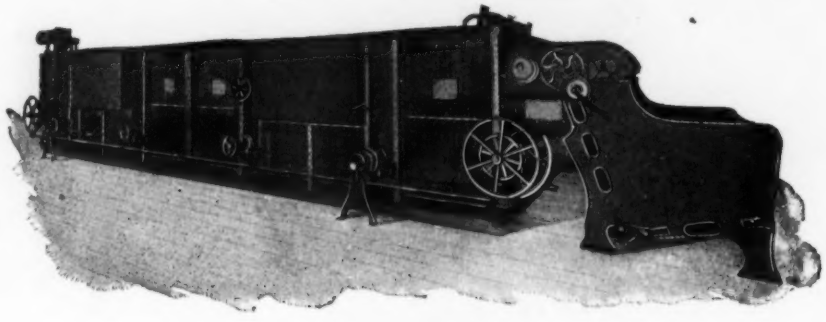
49 Westminster Street.

Our Machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our Fulling Mill for extra heavy goods and blankets.

C. G. SARGENT'S SONS,

GRANITEVILLE, MASS.



... BUILDERS OF ...

Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
Burr Pickers, Etc.

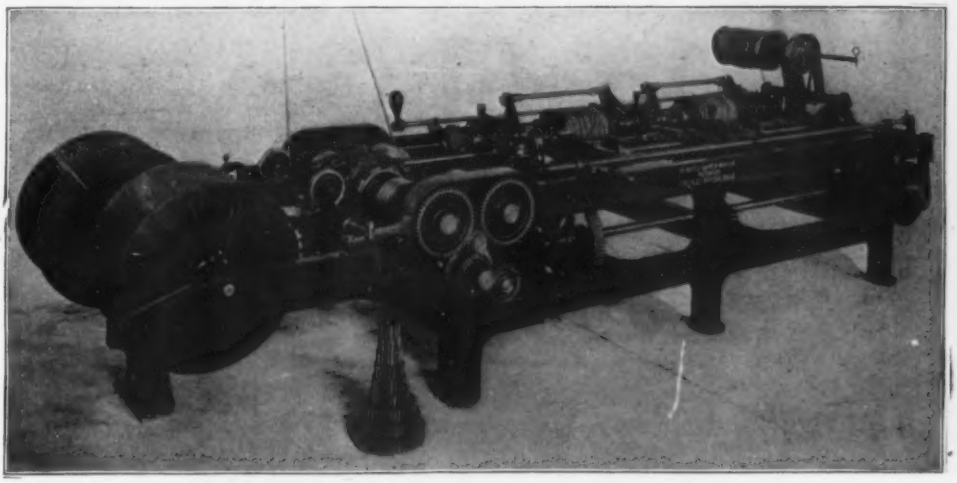
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

Also, Agents SAMUEL LAWSON'S SONS' Jute and Flax Machinery.

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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

SHOE AND CORSET LACES, BANDING

AND ALL BRAIDED FABRICS.

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Builders of Textile Machinery

FILLING COP WINDING MACHINES. Spindles driven by belts or by gears, and bobbins can be made to wind any kind of filling from the coarsest to finest numbers, from Skeins, Spools, Cones, Mule Cops, or any other Spinning or Twister Bobbins. These machines can be arranged to wind cops or butts from the largest used in weaving to the smallest cops or butts for cotton filling used in the silk trade.

OUR MACHINERY PUTS YARN IN CONDITION FOR MANUFACTURING AS SHOWN ABOVE.

BANDLESS SPINDLE SPOOLING MACHINES; adapted to the finer grades of yarn and to the finest silk. ***PRESSER DRUM SPOOLING MACHINES;*** arranged to spool in any way the trade requires. ***BANDLESS VARIABLE SPEED MACHINES;*** to wind the large bobbins used in knitting mills. ***CONICAL AND STRAIGHT TUBE WINDING MACHINES; BRASS BOBBIN WINDING, SPOOLING, WARPING*** and other machinery for lace mills. Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, etc., etc.

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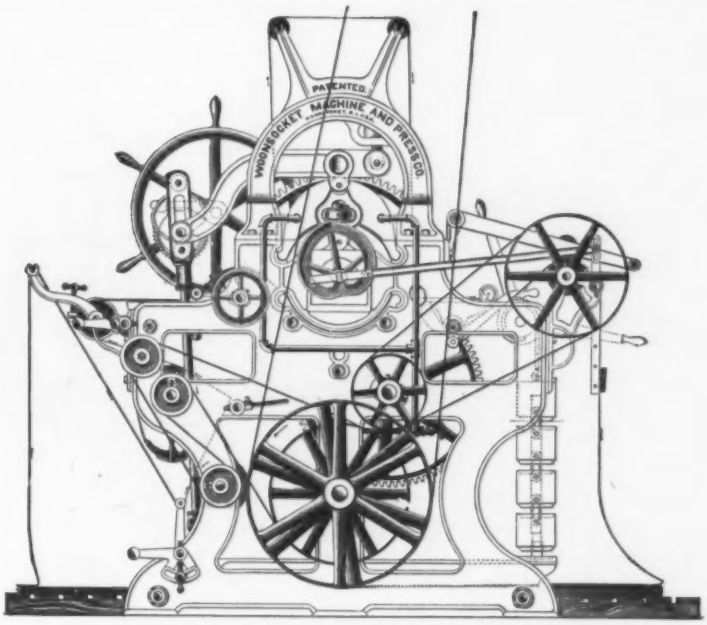
Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



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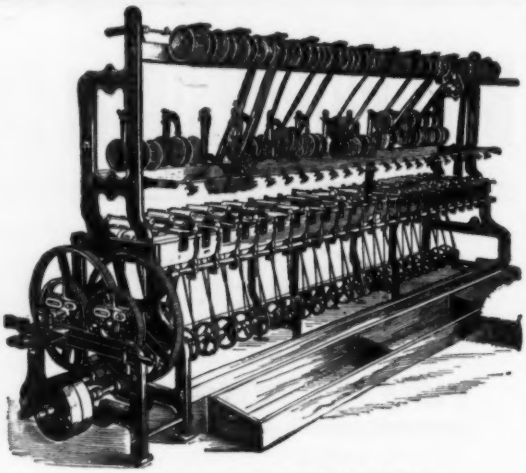
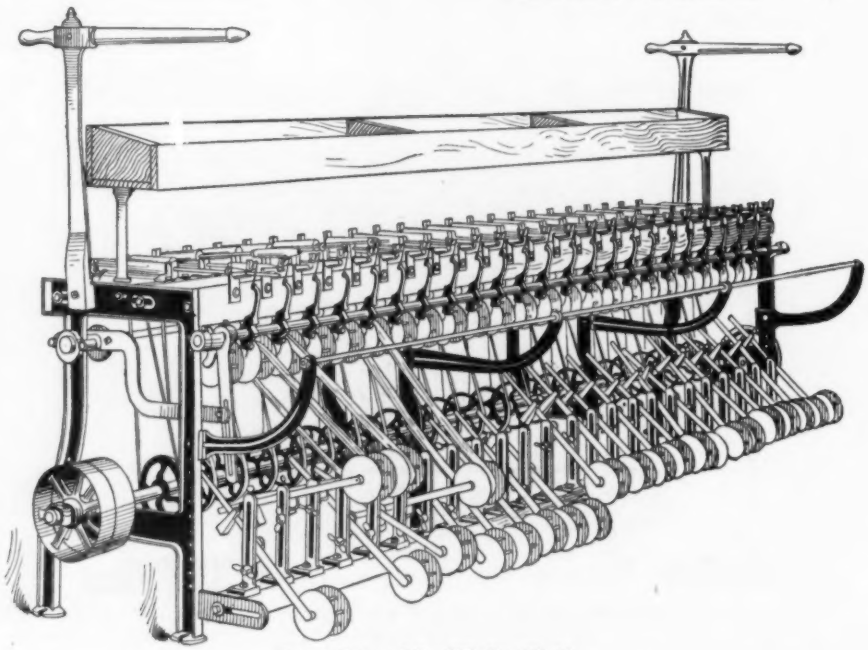
SPOOLING, WINDING, WARPING AND BEAMING MACHINERY



Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



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JACOB K. ALTEMUS,

2818 North 4th Street, PHILADELPHIA, PA.

FULL PARTICULARS ON APPLICATION.

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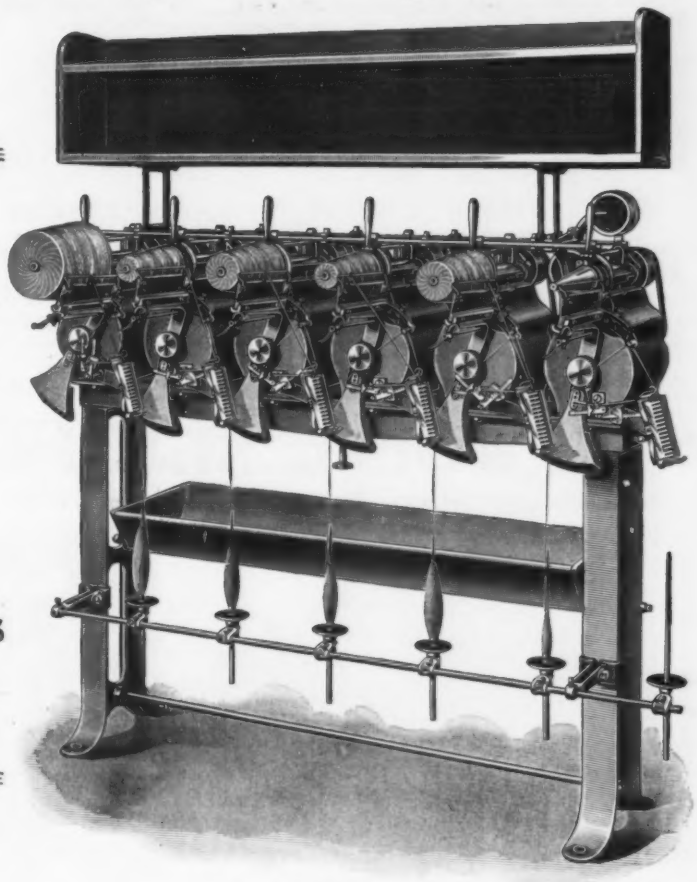
Twentieth Century Winding Machine

Our New
No. 50 Machines
Wind Cones
for
Knitting and
Double Fine Yarns
Twisting.



FLOOR SPACE 4' 8" x 1' 8"

They Combine { **Durability, Compactness, Simplicity, Economy.**

Fitted with such delicate tension devices that the finest yarns are wound without strain at high speed.

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OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

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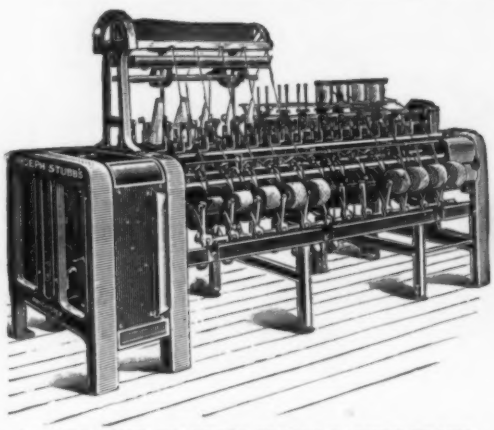
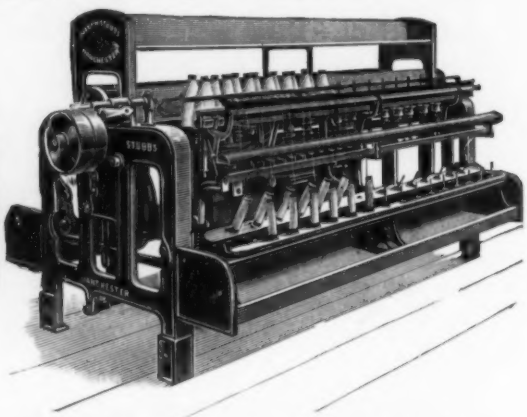
JOSEPH STUBBS, . . Manchester, England,

SPECIAL MACHINERY,

For Winding Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER.
With Patent Tapering Motion, for Single Flanged Bobbins.

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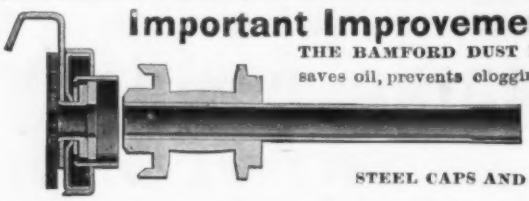

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THE BAMFORD DUST PROOF and SELF-LUBRICATING SPINDLE TUBE saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, and most important of all, makes PERFECT YARN. Refer to largest worsted mills.

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Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

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Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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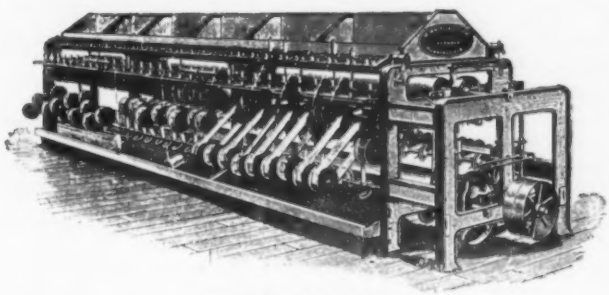

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Moore & Whiteley's Patent Wool and Cotton Dryer.

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Cross Raising Machines, Wool Scouring Machines.

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Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

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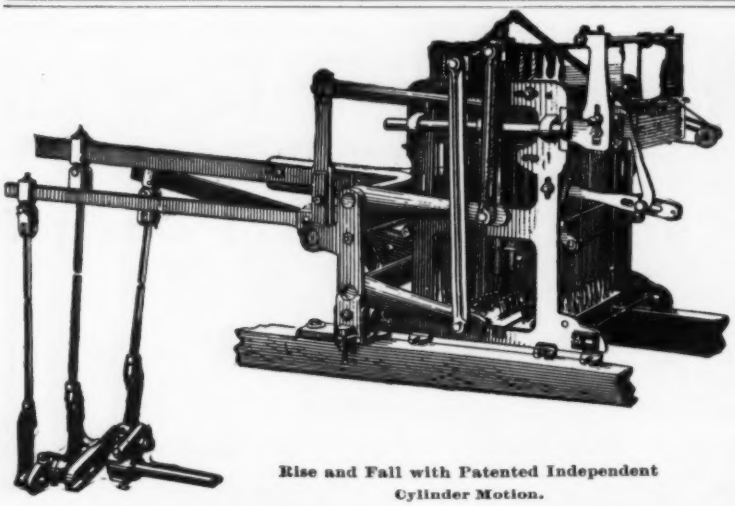

Rise and Fall with Patented Independent Cylinder Motion.

USE THE

HALTON JACQUARD

"The Best Machine on the Market"

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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Allegheny Avenue and C Streets,

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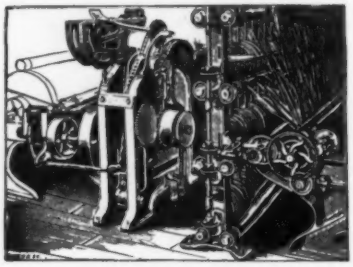

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TORRANCE PATENT AUTOMATIC BALLING MACHINE

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

Write for particulars.

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For Cotton, Woolen, Worsted, Plush Goods, Etc. Shearing Machines a Specialty.

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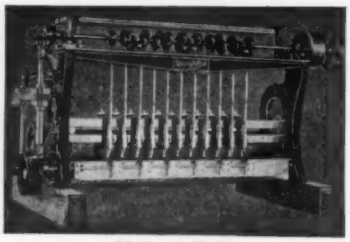

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FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

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Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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Sew any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

Send for new circular telling how to get perfect work in this department.

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Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 3-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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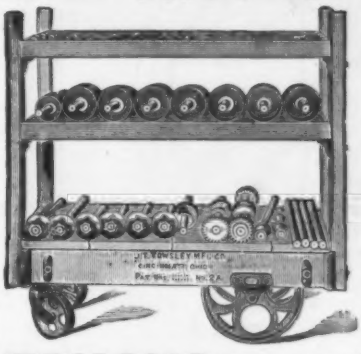
PATENT ASSEMBLING **TRUCKS** FOR MACHINE SHOPS



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GREAT TIME and LABOR SAVER.

Built without shelves or with any number desired.

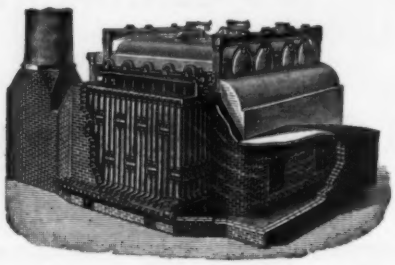
Will be sent on trial.

TRUCKS For Dye Houses, Finishing Works Cotton or Woolen Mills.

In Supplying Boilers with Hot, Purified Water,

Thus keeping a larger heating surface, as well as meeting sudden demands for power, the

Green's Economizer



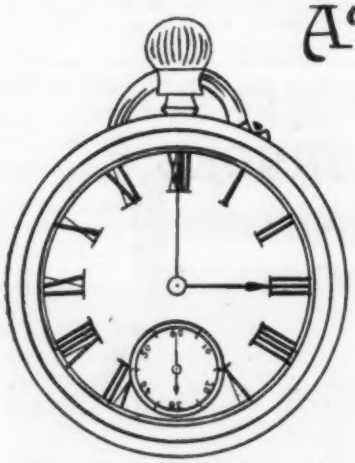
Is but beginning its Savings to Plant Owners.

What has been, and possibly will again be, cost of fuel—one of the greatest expenses of a plant, is reduced from 10 to 20%. Mills, Bleacheries and Dye Works having a *Green's Economizer* realize the greatest saving. We will be pleased to send our free booklet showing construction and how applied.

The Green Fuel Economizer Co.,

Sole Manufacturers in the U. S. A. **MATTEAWAN, N. Y.**

Deliveries always on Time



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Heating, Drying and Exhaust Systems.
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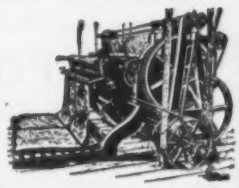
New and Second-Hand Cloth Presses

LATEST MILLER ROTARY STEAM CLOTH PRESS.

Patent Flexible Steel Bed. Pressure automatically applied by power.
If interested in Cloth Presses, either new or second-hand, write the manufacturers.



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WOONSOCKET, R. I.

FINISHING MACHINES Shears for Cloth, Carpets, Rugs, Plush with sets of Shears for one or both sides; Lapping, Folding, Rolling, Measuring Machine. The two and three-roll machines make solid roll holding length and finish. Baling and finishing Presses. HOWARD FOUNDRY & MACHINE WORKS, LANSDOWNE, Delaware County, PA.

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TRIPLEX POWER

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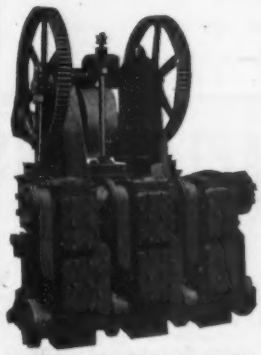

For TANK PUMPING in MILLS, BLEACHERIES, DYEHOUSES, etc.

We make **Pumps** for every service.

Complete Catalog on application.

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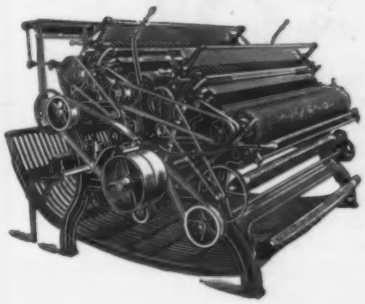

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No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

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Salem, Mass., U. S. A.

50%

Reduction in the soap consumption can be realized in a majority of the textile mills in this country, to say nothing of overcoming the necessity of rescouring and dyeing. Colors will be brighter and goods cleaner and neater and softer.

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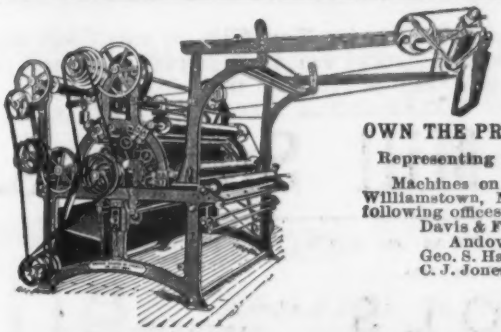

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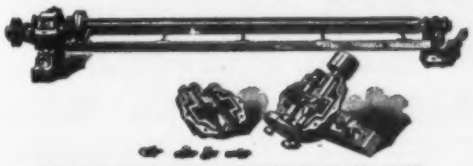

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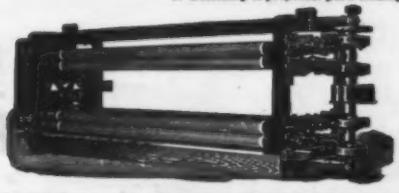

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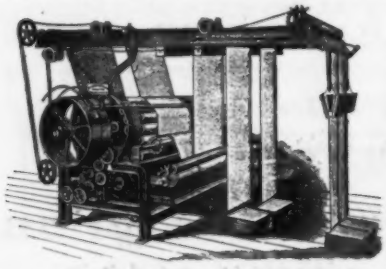

Long or short nap as desired on cotton or woolen goods, from the lightest to the heaviest.

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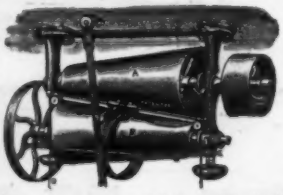

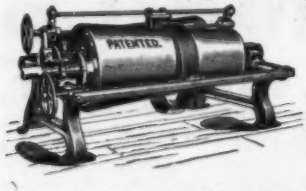

Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Deanison Tag Co., Boston, Mass., large number, small sizes. Saco & Petteo Machine Co., Newton, Mass., 375 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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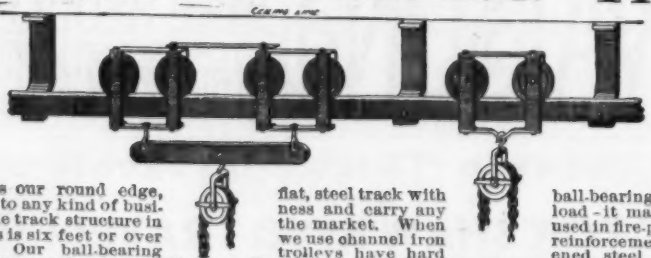

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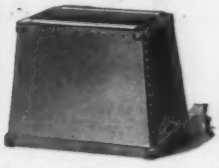

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For Mills, Factories, Warehouses, etc.

Our Belt Power, Hand Power, Electric, Hydraulic and Steam Freight Elevators are given the benefit of the most accurate construction. They are reliable, durable and economical of power. Write for descriptive booklet. : : : :

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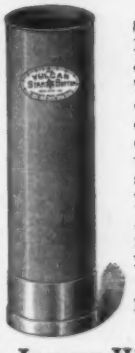

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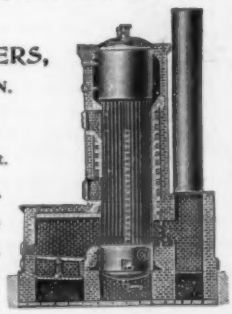

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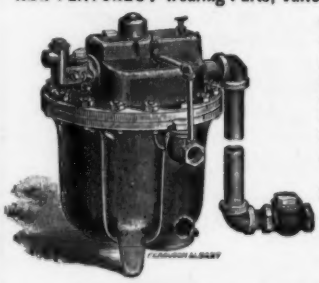

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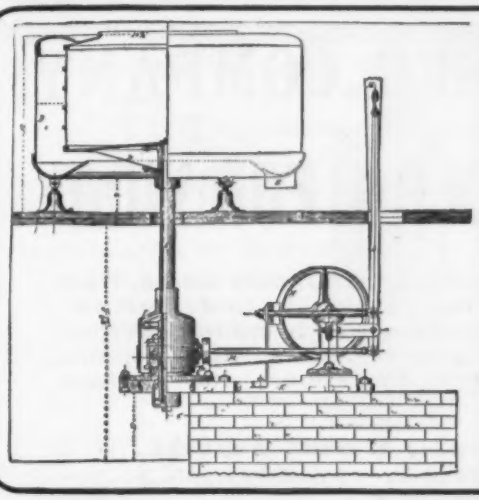

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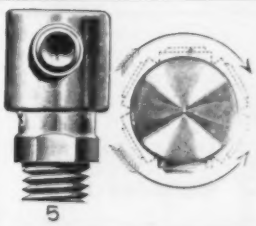

5

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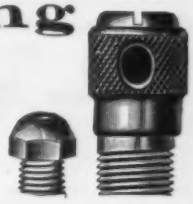
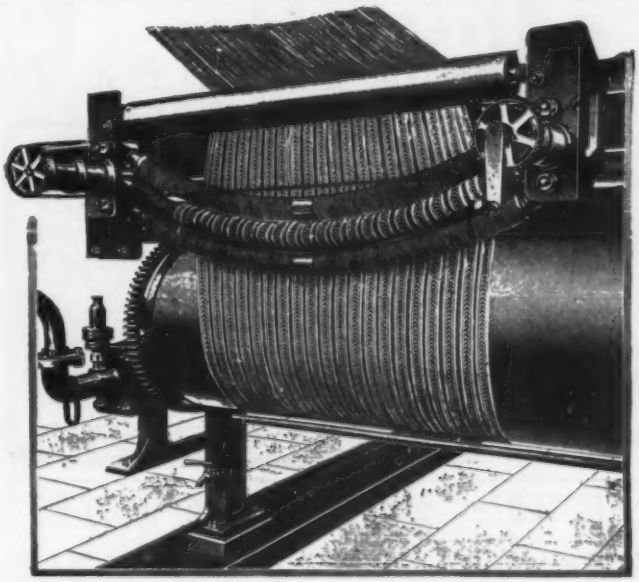


A PERFECT CLOTH EXPANDER



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Improved Watchman's Time Detectors

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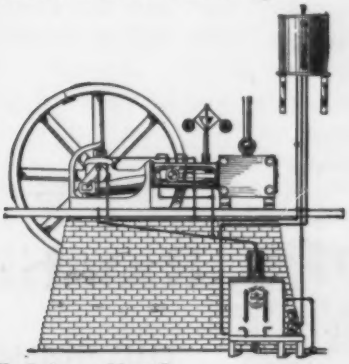

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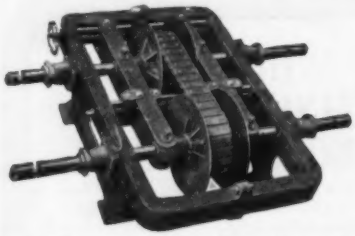

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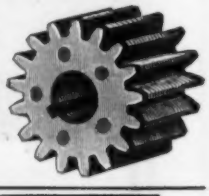

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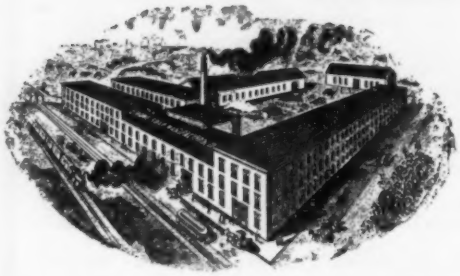

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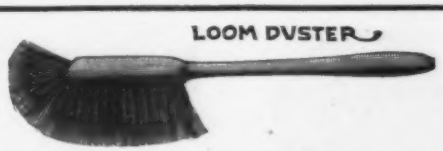

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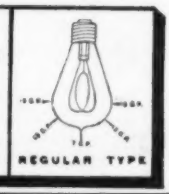

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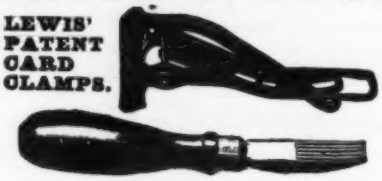

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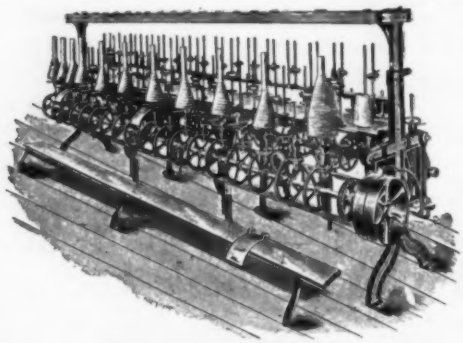

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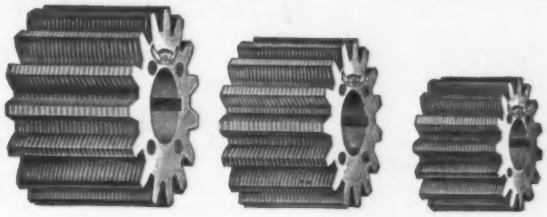

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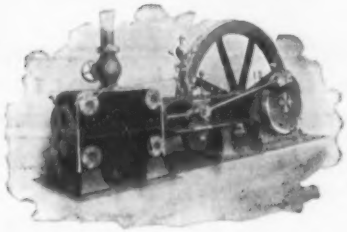

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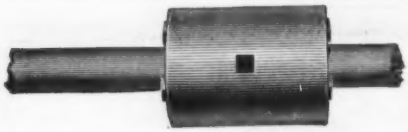

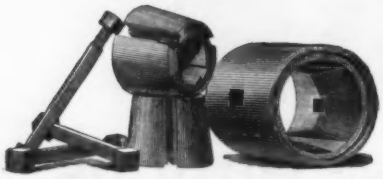

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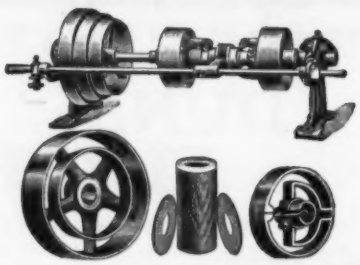

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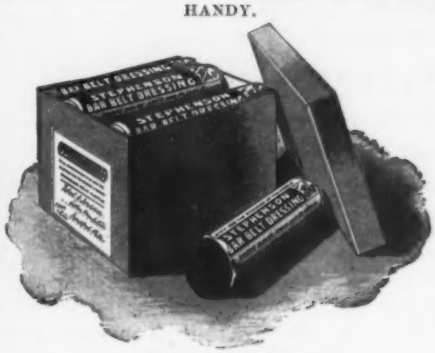

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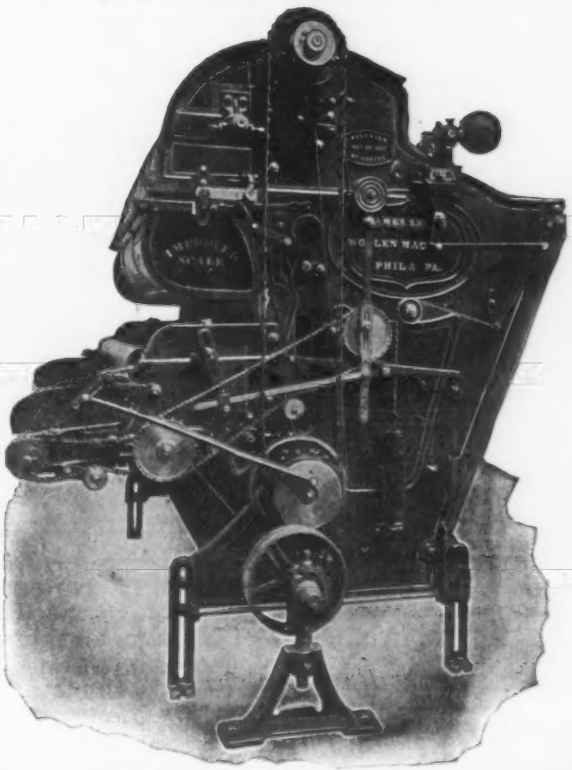

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PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

The Directory of the Knitting Trade in the United States and Canada

is published early each year by Lord & Nagle Company. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $2.00.

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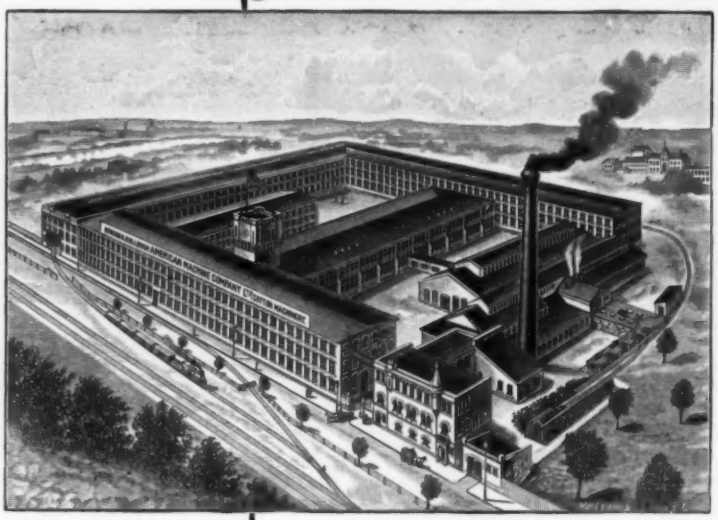

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VOL. 26. (NEW SERIES.) FEBRUARY, 1904 No. 5.

Monthly Comment.

The Wool Growers' Convention.

The annual meeting of the National Wool Growers' Association at Portland, Oregon, last month, was interesting chiefly because of the evidently sincere effort to bring about a better understanding between wool growers and wool manufacturers. C. H. Harding, president of the National Association of Wool Manufacturers, made an address that was very favorably received and in which he referred to the "mixed goods" bill and the methods of marketing wool.

John B. McPherson, secretary of the manufacturers' association, followed, and illustrated his remarks with samples of shoddy. He explained to the wool growers that the much abused shoddy was often superior to many kinds of wool. The speaker described the process of making shoddy and showed why it is impossible to distinguish wool shoddy from wool when manufactured into cloth.

While it is doubtful whether the wool grower's dislike of shoddy has been lessened by this heart to heart talk at Portland, there is reason for believing that his realization of the power of natural laws has been made clearer, and his reliance on Acts of Congress correspondingly weakened.

The Cotton Trade.

The price of raw cotton has been soaring to dizzy heights during the past month, middling uplands having sold for 17 cents. The trade is becoming inured to high prices and quotations that would have been looked upon as impossible a few weeks ago now excite no surprise. Let 17 cents be quoted for a day and straightway people look upon 16 cents as a bargain price.

The increased cost of cotton has upset the calculations of manufacturers and merchants, but both are beginning to realize that uncertainty as to values is even more demoralizing than high prices for the raw material. Granted that cotton is to cost 15 cents per pound, the spinner, weaver and tradesman can soon adjust their affairs to that level. If, however, cotton is to fluctuate between 10 and 20 cents the spinner, weaver and merchant must abandon their usual vocation of manufacturing and dealing in cotton goods for a moderate profit, and become speculators in a very speculative commodity, follow the fluctuations of the market from hour to hour and take all the speculators' desperate chances of loss or gain.

The temperament required for manufac-

turing differs so widely from that needed for speculating that it is impossible to combine the two callings. It is for this reason that manufacturers are standing aside and letting the cotton market alone until the air has cleared and prices have found a level warranted by the laws of supply and demand. Whether that level is to be 15 or 20 cents is a matter of secondary consideration. What manufacturers and merchants want is some settled basis on which they can calculate cost and carry on business.

The prices of cotton goods still lag behind the raw material. Many grades of goods have advanced, but not in proportion to the increased cost if made from 15 cent cotton. This phase of the situation is well illustrated by the print cloth market. A year ago regular goods were selling at 3 1/4 cents, cotton at 8 3/4 cents. At these figures the margin as calculated by the Fall River method was as follows:

45 yards cloth, 3¼c.	$1.46¼
8 lbs. cotton, 8¾c.	.70
Margin	.76¼

Today with regular print cloths at 3⅞ cents, and cotton at 16 cents, the margin is:

45 yards cloth, 3⅞c.	$1.74⅜
8 lbs. cotton, 16c.	1.28
Margin	.46

This is less than at any other time for which we have a record, and shows a reduction of 30 cents in the margin during the past year. The comparatively low level of the present prices for print cloths is still more plainly shown by calculating the price of goods required to restore the margin to the level of one year ago with cotton at 16 cents:

Margin one year ago	$ .76
8 lbs. cotton, 16c.	1.28
45 yards cloth, 4.54c.	2.04

This calculation shows that with 16 cent cotton, print cloths must advance ⅔ cent per yard to 4.54 cents to give manufacturers the margin of a year ago. In other lines of goods a similar condition is found. The price of the manufactured product is in almost all instances below the cost of production. In many cases a partial readjustment will be found by substituting lower grades instead of advancing the price. This process, however, has distinct limitations and the consumer will soon find that a reduction of the quality is but an increase of the price in disguise.

For this country the solution of the present difficulties in the cotton industry lies in the establishment of a reasonably stable price for raw cotton, preferably at a high level. A high price for cotton means more wealth for the United States, and there is no other country on earth whose people are better able to pay the increased cost for cotton goods.

Imitation of Selvage.

An interesting and important decision as to the right of textile manufacturers to the exclusive use of a selvage has been rendered by the New York Supreme Court in the case of the Waterloo Woolen Manufacturing Company against the firm of Hardt, Von Bernuth & Co. The Waterloo company used a particular style of selvage on all their wool dyed cloths, and this selvage had become so well known in the trade that buyers accepted the selvage as proof that the goods had been made by the Waterloo company. Some time ago it was discovered that two lines of similar goods used for carriage cloth were being made with a selvage in close imitation of the Waterloo selvage. The Waterloo company called the manufacturers' attention to the fact and requested that they discontinue the imitation.

As this request was not complied with suit was brought against one of the customers of Hardt, Von Bernuth & Co., in the Federal Court of Massachusetts. Another suit against the proprietors themselves was brought in the New York Supreme Court. The Federal Court decided that the Waterloo Woolen Manufacturing Company "is entitled to the exclusive use as a trademark for

woolen fabrics of the device in the form of a selvage," and holding that the defendant had violated the rights of the complainant, ordered the latter to refrain from using in connection with the manufacture or sale of any woolen fabric not of complainant's production any selvage like or substantially like any of the selvages in regard to which the infringement had been shown.

The New York Supreme Court has perpetually enjoined the defendants, Frederick A. Von Bernuth and Ernest R. Krause, from making use in connection with the manufacture or sale of any woolen fabric not of plaintiff's production of any selvage like or substantially like any of the selvages described in the complaint and of which specimens were produced by the plaintiff, and from doing any other act which shall be calculated to cause any woolen fabric not of plaintiff's production to be confused with or mistaken for the fabrics of the plaintiff.

The Textile Strike at Crimmitschau.

Nearly six thousand textile workers have been on a strike for higher wages and shorter hours in the Crimmitschau district of Saxony since August 22, 1903. The strike has been marked with much bitterness on both sides and the authorities have been repeatedly called upon to suppress violence. At the present time, nearly six months from the beginning of the struggle, there are no signs of an early end. The Saxon Landtag appointed a commissioner to summon representatives of both employers and strikers, listen to their statements and endeavor to effect a settlement. His report has recently been made public, and contains much interesting information regarding the labor conditions in Germany.

The workmen first submitted to the commissioner the following series of propositions embodying the terms upon which they would be willing to return to work:

1. A reduction of working hours from 11 to 10 1/2 per day, the new rate amounting to 62 hours per week. At the end of a year a new agreement to be made for a further reduction.

2. The 10 1/2 hours to include five minutes for washing up at noon and night.

3. Work day to end at 5 o'clock Saturday.

4. A cessation of work for 1/4 hour for breakfast to be left to individual arrangement between employers and workers in each mill.

5. Wages for piece work to be increased 5 per cent.

6. Wages of day workers to remain unchanged.

7. The system of paying weavers by the number of ends in the warp to be abolished, and the wages to be gauged by the picks.

8. The employers to agree not to hire any foreign workers as long as any of the present strikers remain unemployed.

9. Insults and violence on both sides during the strike to be overlooked.

The employers flatly refused to even consider these terms and made no counter proposition. They stated to the commissioner that the acceptance of the strikers' proposals would result in the ruin of their industry. They cited the large number of failures in their line during recent years and stated their present scale of wages for spinning vicuna yarn was 60 per cent. higher than in Austria. The employers stated the strike was due to the agitation by social democrats.

Imports of Wool and Woolen Goods.

The prosperity of the United States during 1903 is indicated by the large quantity of wool and woolen goods imported in that year. We imported 173,575,891 pounds of wool, valued at $22,811,734. These figures have not been exceeded in either weight or value in any previous year, excluding, of course, the free wool period of 1895-7. The woolen goods imported last year were valued at $19,321,504. This is in excess of the imports of any previous year since 1898 and is nearly one-half the value of the annual imports previous to the Wilson bill. It will be remembered that at that time, 1890-94, a ruling of the Treasury Department resulted in a large increase of our imports of woolen goods. In one year alone, 1890, the imports of woolens were valued at over $52,000,000. Although last year's imports were high for the Dingley tariff yet the efficiency of that law is disclosed by comparing last year's imports with those previous to 1894.

Apprenticeship System.

The difficulty experienced by Canadian manufacturers in securing an adequate supply of careful and competent help has led the Employers' Association of Toronto to attempt to restore the apprenticeship system. Articles of apprenticeship have been drawn up and printed for distribution, with a view of inducing manufacturers to adopt the system of making apprentices of what are usually known as learners. This decision was reached only after a very careful consideration. The manufacturers believe that the apprenticeship system properly conducted will be to the advantage of both employer and employee. The experiment will be watched with interest, even by those who are doubtful of its success at this time.

Memorial to T. R. Ashenhurst.

Few names are more closely connected with the literature of textile design and manufacture than that of the late T. R. Ashenhurst, who was for fifteen years head master of the Bradford Technical College in England and in later years a resident of the United States, having made Jamestown his home. It was largely due to Mr. Ashenhurst's efforts that a good foundation was laid for textile schools in England. He worked enthusiastically and conscientiously for the success of the institution with which he was connected, and found time also for the publication of his own books, through the instrumentality of which so many designers and manufacturers procured much of their knowledge on this subject. Like many professional and mill men he failed to accumulate much money. His friends and fellow craftsmen in Jamestown and other of his American friends feel that some recognition should be made of his services in the interests of textile technology, and a fund has been started for the purpose of the removal of his body to a more suitable lot and the erection of a monument as a memorial to his talents and unselfish disposition in imparting to his fellow craftsmen from the rich store of knowledge which he possessed. Already nearly $200 have been raised, and at the time of writing about $90 more are required to meet the necessary expenses. There are doubtless many personal friends of his and those who have read his books who would be glad to contribute to this fund, and we take pleasure in calling attention to the matter in this way. Any contributions may be sent to Abraham Ashworth, care of Ahlstrom-Ashworth Co., Jamestown, N. Y., who will acknowledge receipt.

The Wool Manufacturers' Meeting.

The annual meeting of the National Association of Wool Manufacturers was held at Hotel Vendome, Boston, on the evening of February 3d, and the change from midday sessions, which have been held for a number of years, to an evening meeting was favorably commented on by many of the members.

The past year was not an eventful one in the history of the woolen industry, and with the exception of the Grosvenor bill, no distinctly adverse legislation is before Congress.

Mr. Charles H. Harding, who for the past four years has served the association as president and given it a great deal of time and enthusiasm, felt that his other business cares prevented his continuance in office, and Mr. William Whitman, president for a number of years previous to Mr. Harding's term of office, was again chosen to that office. The other officers elected were: Vice-presidents, Charles H. Harding of Philadelphia, William M. Wood of Boston, Fred S. Clark of North Billerica; treasurer, Benjamin Phipps of Boston; secretary, John Bruce McPherson of Boston.

A vote of thanks was extended to Mr. Harding, the retiring president, for his labor of love for the association during his four years' service.

A vote of congratulation was also extended to Mr. Benjamin Phipps, who has served as treasurer of the association for twenty years.

Resolutions were also passed respecting Mr. George Sykes, who died December 23.

After the business meeting a reception followed, and when dinner was announced

at 7 o'clock, a company of over 100 members and guests filed into the dining room and filled the long tables. The speeches of the evening were unusually interesting. The greetings of the Commonwealth were extended by Mr. Louis A. Frothingham, speaker of the House of Representatives. Mr. Harding told of the visit paid by him as president and by Mr. McPherson as secretary of the Woolen Manufacturers' Association to a joint convention of live stock growers in Portland, Ore., where the opportunity was given them to explain to the wool growers the annoyances and shortcomings of the Grosvenor bill, with the result that resolutions were passed by the convention which have the effect of nullifying the measure in its present form, so far as it depends upon the active support of these powerful Western associations.

The principal speakers of the evening were Hon. Henry S. Boutell, of Illinois, and Hon. James E. Watson, of Indiana, both of these gentlemen being members of the Ways and Means Committee. They pointed out the prosperity the country has enjoyed under the present tariff law, which has been in effect longer than any other in the statute books, and this in the face of dire predictions made by its Democratic opponents. Mr. Watson cited the admissions of Mr. Williams, the Democratic leader of the House as to the failure of free silver, and imperialism as live issues of the Democratic party today, and said he saw no other line of campaign for them to fight on in the coming presidential election unless it was the tariff, and for that reason manufacturers and all believers in the protective tariff must stand firm for the system which has proved so satisfactory for the past seven years. They must be on their guard against encroachments under the guise of reciprocity which does not reciprocate, and whatever is done in this direction must be strictly in the line of reciprocity for non-competitive products.

The exercises were brought to a close by a few words from Mr. John P. Wood of Philadelphia.

It is seldom that the association has had the opportunity of listening to such forceful and brilliant speakers, and the meeting will pass into history as one of the pleasantest on record.

Cuban Cotton.

There have been many reports during the past year or two of the efforts to raise cotton in Cuba, and we have recently received the following letter with the sample referred to:

Santo Domingo, Cuba, Jan. 19, 1904.

Editor Textile World Record:

Under separate cover I mail you a sample of Cuban raised sea island cotton, produced this season by me. I am so thoroughly convinced of the extraordinary length of its staple and fineness of its texture, that I think it may possibly be of interest both to you and your readers.

Cotton began to be planted in Cuba about a year ago; and because of the unbroken success of the ventures made in this line, the industry is growing with a great deal of rapidity.

The possibilities of cotton raising on this island are simply immense; the lands are cheap and exceedingly fertile; and the climate of that semi-tropical nature which, with its long summers and short mild winters, best lends itself to the growth and greatest perfection of this plant.

I predict a large output of cotton from Cuba within the next few years.

Trusting that this information and sample will prove of interest to you, I am,

Yours respectfully,

John A. Floyd.

The sample sent with the letter was a very good grade of the Sea Island variety, the staple being about 1 1/2 inches in length. While the condition of the sample was not all that could be desired, the defect could be easily remedied. The results of Mr. Floyd's efforts as indicated by the sample are very encouraging and point to a bright future for the cotton growing industry in Cuba.

We have this sample at our Boston office and shall be pleased to show it to any one interested.

Weighting Silk.

The depreciation in the European silk trade has continued now for several years and shows no signs of abatement. In fact, reports indicate that conditions are growing

worse instead of better. Prices are extremely low and the market is flooded with cheap fabrics which have been made to meet the call for low priced goods; the poor service which these goods give to the wearer has caused general dissatisfaction on the part of consumers and done much to bring silk fabrics into disrepute.

It is generally admitted by both silk manufacturer and merchant that the depreciation of silk fabrics, particularly the excessive weighting of goods, is a great mistake and a serious menace to the silk industry. There has been much discussion of the subject, but no practical steps have been taken to raise the standard of silk goods until recently when the manufacturers of Como formed an association with the object of securing an agreement among the dyers of Zurich to limit the amount of weighting material in silk goods. No agreement has yet been reached, but the attempt will be watched with interest in the trade outside of Como as the fault is general and by no means confined to one particular district.

English Conservatism.

A recent case in one of the English courts shows the strength of British conservatism and to what extent old customs still prevail in the English textile industry. Before the invention of the steam engine and the development of the factory system, a law was passed in England imposing penalties for marking out the owner's name from the sheets in which worsted yarn or other textile material was packed, the object of the law being to insure the return of the sheets to the owner. Since that time textile methods have been revolutionized by the invention of the steam engine and labor-saving machinery. These have in great measure rendered the old law unnecessary, but the worsted inspectors appointed to enforce its provisions appear to be of a contrary opinion. The following account of the case above referred to was taken from The Dyer and Calico Printer.

Another prosecution under the archaic Worsted Act contains interest for all engaged in the commission handling of material within the Worsted Act's area. The case again illustrates the unpleasant fact that an innocent and honorable man may be brought into the police-court for an offence that in other trades and districts would be no offence at all within the scope of the criminal law. Mr. Joseph Robertshaw, wool-comber, of Bradford, sold to a dealer 3 1/2 cwt. of bagging and 66 wool sheets at 2s. 6d. each. Among other sheets were three marked with the name of D. Eastwood & Sons, and it was in respect of them that the action was raised. There was a conflict of evidence as to whether or not defendant had ordered the blacking-out of Messrs. Eastwood's name. In any case the numbers remained, and practical witnesses concurred in saying that the sheets must have still been recognizable by anyone in the trade. The stipendiary magistrate was of the opinion that Robertshaw had done wrong, but, lacking evidence of felonious intent, the defendant was discharged under the benefit of doubt.

The causes of grievance against the working of the Worsted Act are twofold. In the first place a civil remedy exists. The return of sheets and packages is eminently a matter of account capable of adjustment without criminal proceedings. In the second place, the Act was designed to check irregularities among home-workers in pre-factory days and to put an end to the purloining of the material of their employers. To spy upon possible thieves Worsted Inspectors were appointed, and now that the original occupation of these gentlemen has gone, they are reduced to the necessity of finding charges against dyers and combers, as two or three instances given in these columns show. The operation of the Act lends no dignity to the law.

The Cotton Industry in Italy.

The following estimate of the cotton machinery in Italy at different periods has been compiled by the British consul at Milan in advance of the official report:

Year.	Spindles.	Looms.
1897	2,092,730	70,000
1899	2,340,000	100,000
1901	2,440,000	
1903 (Jan. 30)	2,700,000	130,000

These figures show an increase of nearly 30 per cent. in the number of spindles since 1897, and an increase of 86 per cent. in the looms. The growth of the cotton industry in Italy has been by leaps and bounds during recent years, the development being due to the cheap labor and unexcelled water power of Northern Italy.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

Since the first of the year opening of the various heavy weight lines have taken place, and apparently more surprise concerning the reduction in price, rather than activity in booking orders, has been prevalent in the district.

The opening of overcoatings and low grade woolens was largely completed last month, and with the exception of cotton warp goods the reduction of practically 5 per cent. has been made; the surprise manifested is due to the fact that conditions, as one selling agent stated, do not justify or favor the cutting of prices at the present time; the cost of labor and raw material is fully equal to what it was at this time last year, and either the quality or the profits must suffer.

The American Woolen Co. opened in Division B, Department 1, the balance of the suitings, consisting of Clay mixtures, fancy weave suitings, cheviot mixtures, twist mixtures, rain cloths, plain and fancy weave piece dyes, fancy weave piece dye cheviots, fancy weave undressed worsted and piece dye trouserings. In Department 3 were shown the products of the Vassalboro Mill, comprising suiting from 72 1/2c. to $1.00; Bay State, a very complete line of mercerized piece dyes from 77 1/2c. to 97 1/2c.; Anderson, fancy twist and silk noil cassimeres from 82 1/2c. to $1.00; Moosup, all wool twist cheviots, 95c.; Chase, worsted and noil twist cheviots, 95c.; Weybosset, all wool silk noil and twist fabric from 85c. to $1.25. Department 1 exhibited a full line of piece dyes from 82 1/2c. to $2.37 1/2. A few typical lines convey a fair estimate of the market price position: A 16 ounce cheviot at 90c. and $1.00 was 95c. and $1.07 1/2 last year; 18 ounce suitings at $1.15, $1.22 1/2, $1.27 1/2, $1.30, $1.35 and $1.42 1/2 show a reduction of 7 1/2c. below last year's quotations. Fancy weave cheviots $1.02 1/2, $1.05 were last year $1.07 1/2 and $1.10.

Clay mixtures, 16 ounce, $1.00, $1.07 1/2, $1.30; 18 ounce, $1.12 1/2, $1.20, $1.42 1/2; 20 ounce, $1.55. The reduction of these last numbers is from 10c. to 15c. below last year.

Unfinished worsteds at $1.15 to $2.37 1/2. Twist suitings and rain cloth, 16 ounces, $1.50; 18 ounce, $1.65; the 18 ounce last year was sold at $1.80.

Parker, Wilder & Co. have opened their all wool Thibets, 16 to 20 ounces, 82 1/2c. to $1.35; Concord, all wool double and twist fancy cheviots at $1.00. Indian Spring cassimeres have been opened by H. J. Libby & Co. at $1.10, which is the old price.

H. W. T. Mali & Co. have opened their cassimeres at 80c., a reduction of 2 1/2c. from last year.

Although these various openings have not created any particular stir, clothiers have placed a fair volume of orders, and current reports are that business is fairly satisfactory. Mr. H. E. Peabody, representing the Coronet Worsted Mills, stated that they had already taken enough orders on some of their numbers of fancy suitings to keep the operators busy until July; the demand for rain cloth is steady and probably will continue as the season advances. Western buyers have not yet come to the market, and it is too early to predict what the outcome will be. Some disappointment is expressed regarding the movement of heavy weight overcoatings, but within the next few weeks a marked improvement in the demand is confidently looked for, and indications are that these optimistic expectations will be realized.

DRESS GOODS.

No material improvement has taken place in this division during the past month; the condition prevailing is one of inactivity; a few heavy weight lines of the staple variety have been opened, such as coverts, Venetians, tricots and allied year round fabrics, but up to the present but little attention has been given to them. To reiterate what was said last month, the coming spring has now every indication of being a plain goods season; very early in the season it was announced by many that fancy weaves would predominate, but the trend has developed in the other direction. There will of necessity be a number of fancy costumes worn and some of the designs brought out have met with considerable success, but the leading fabric for spring will

be plain monotone veiling; nub voiles have received due share of attention for use in suits and demi-costumes.

Broadcloths are rapidly gaining in favor and is one of the features deserving of consideration. The demand for light weight broad cloths in light colors as well as street shades is much better than early buying indicated.

Cheviot serges promise to be as popular during the coming spring as they were a year ago. For suits and skirts mixtures maintain their popularity. Low grade zibelines are practically out of the market, but the better goods at $1.00 to $1.25 are still called for in considerable quantities.

Mohair is pre-eminently the most popular fabric for all sorts of uses, and the sale has not proved disappointing to anyone in the trade; the wide variety exhibited comprise most attractive features, including neat hair line stripes and checks in white over navy, two jacquard designs, mohair in all colors with mercerized dots, mohair crepes, mohair melanges.

Sublimes, landsdowns, silk and wool crepes, silk and wool eoliennes are all meeting with strong support for spring wear.

At Fig. 1 is shown a white ground wool canvas weave etamine, with irregular broken plaids. Fig. 2 is a small broken check wool melange, very desirable for dressy street wear. Fig. 3 shows a leader in dress fabrics for spring, 1904, being a woven geometrical design in monotone veiling.

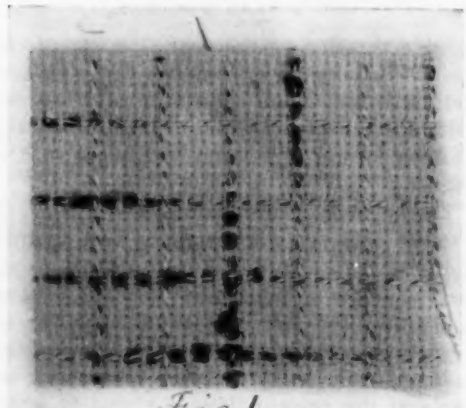

Fig 1

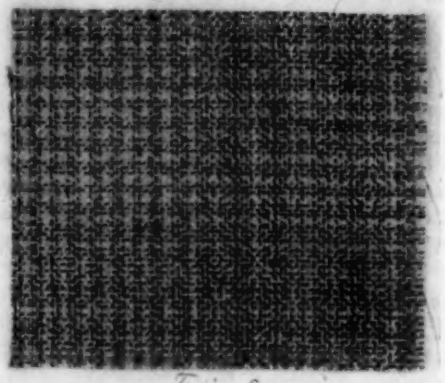

Fig 2

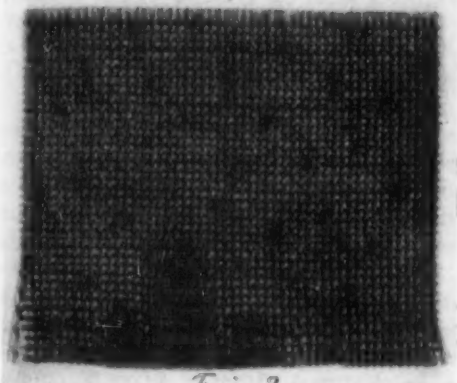

Fig 3

SILKS.

Although there has been no marked improvement in the silk situation, there is a more optimistic feeling apparent, and a prevailing opinion among the trade is that the worst is over. The outlook seems to be more encouraging, inasmuch as fancies are receiving better consideration than they have since their revival a few months ago. The lines shown embrace possibly the choicest designs and patterns in the history of silk manufacture in this country. The dull period seems to have inspired the manufacturers to produce such fabrics as would surely meet with support, and the outlook indicates that their efforts in this direction will in a measure be rewarded. Such fancies as at Fig. 4, called mother of pearl, by Pelgram & Mayer, the manufacturers, are largely used for waists and shirt waist suits for the more exclusive

trade. Small, neat designs similar to Fig. 5 are among the best sellers. Small blue and green broken checks with a larger white regular check like Fig. 6 make exceedingly handsome garments.

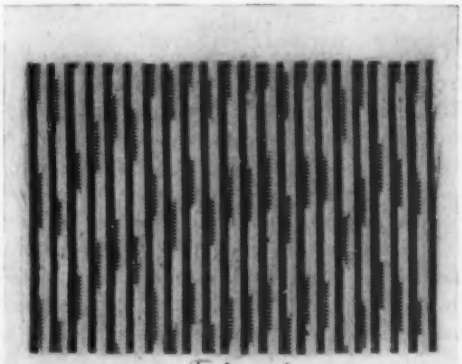

Fig 4

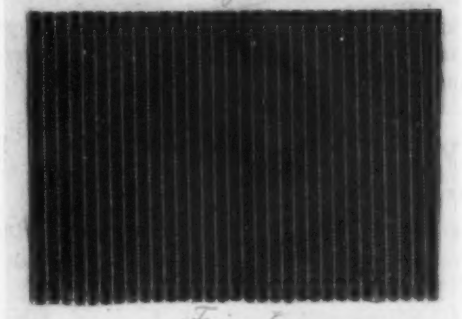

Fig 5

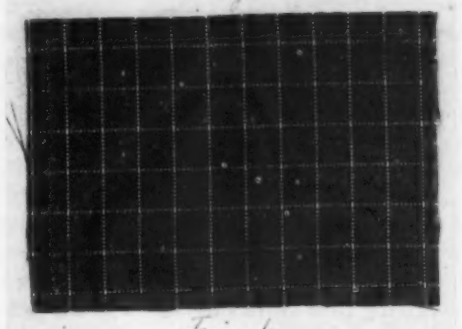

Fig 6

Among the plain fabrics that are receiving the greatest attention may be classed the new Messalines; these come in a soft finish, possessing beautifully lustrous qualities. Peau de cygnes are well thought of and have to a certain extent displaced the heavier peau de soie. The call for plain colored taffetas has not by any means diminished for lining purposes; these will always excel and the demand is steady for such purposes. Jap silks are considered strong owing mainly to the large orders placed by the cutters for goods to manufacture Jap silk waists, the variety of such garments shown this season is most extensive. Shantungs have also been purchased to a large extent for similar purposes. Fancy Shantungs with lace or drawn work stripes and embroidered spots and discs have been in strong request for the same use. Crepe de chine is still a strong favor for evening wear, and is being taken in considerable quantities for current use. The new lines of foulards embrace a larger variety of designs than any other previous season, some exquisite monotones are in evidence, polka dots in various sizes predominate.

WASH GOODS.

The advance in the price of the raw material has not affected the position of the better class of wash fabrics to the same extent as that of staple prints and domestics. In goods of this character the cost of labor is higher than that of the cotton from which they are made with the result that prices remain unchanged. Buyers place their orders whenever possible for such goods in preference to those which have advanced 20 per cent. or more. This season the various lines of wash goods fabrics combine many desirable features. Every objection from the standpoint of style and service has been eliminated and their adaptability for stylish, serviceable summer costumes is unexcelled. There are two distinct classes into which the new goods may be divided: the loosely woven openwork effects and the fine, close weave of the chambray order. The former embrace canvas, etamine, voile and twine cloths; the latter include the countless assortment of plain ground effects developed and printed, woven or embroidered dots, figures, stripes, bourette and boucle effects. The Soie Boucle made by the Parkhill Mfg. Co., and sold by E. Hopper, Poor & Co., is of the chambray order, and is practically the fabric sold a few years ago as swivel silk. This is a dainty silk

and cotton mixture, on which are dots, checks, plaids and small geometrical figures and bourette effects on plain grounds of every color, oxblood, gun metal, helio, champagne and two shades of blue. Suisse broiderie is of the sheer textile order manufactured and shown by the Arnold Print Works; this is a delicate fabric with raised fancy stripes over which are printed small figures and flowers; the color combination comprise a splendid assortment.

PRINTS AND GINGHAMS.

It is apparent to all connected with textile manufacturing that conditions are extraordinary and exceedingly unsatisfactory, both to buyer and seller; to simply say that the market is firm and steadily advancing is a twice told tale, and somewhat tiresome. For months past buyers have been holding back, buying only for their immediate needs, but the time has come when they must replenish their stocks, and at a very decided loss to them. Staples such as denims, drills and low grade ticks for immediate delivery are at a premium. Prints and calicoes are materially higher than they were even a few weeks ago and must be bought; the movement of these staples is naturally much restricted.

LININGS.

Cotton linings seem to be somewhat stronger, especially mercerized goods. Clothiers have placed fairly large orders and a moderate volume of business has been transacted. Fred Butterfield reports satisfactory business on his King Edward and cob web sateens and his bengaline moreen has been sold freely by his road men. Burton Bros. state that good orders have been placed for their Simpson silk, which they are now making a leader. Silesias and percalines are still heavy; the movement in these staple linings has been slow for several months past. Prices are held firm and from 1/2 to 1c. per yard advance has taken place on several numbers.

Harris Tweeds.

BY DAVID PATERSON, F. C. S.

Some good time ago you requested me to obtain, if possible, a few specimens of real "Harris Tweed." These I have got for you and can vouch for their genuineness having obtained them through the Scottish Home Industries Association. No doubt you are aware that the ordinary so-called Harris tweeds made on the borders of Scotland (the South), at Galashiels and Hawich, Selkirk, etc., are merely imitations of the genuine stuff, which is named from the island of Harris in the north of Scotland where the crofters make these tweeds. These Harris tweeds are all hand-made, done in the old style. The spinning is all done by hand, distaff and wheel, scouring by hand; and milling or felting is done by stamping with the bare feet, singing a song meanwhile and beating time with the feet. The dyeing is done in pots in the old fashioned style and the dyestuffs until recently were obtained from mosses, lichens, heather, broom, crotal, and other plants. Now, however, some of the best and fastest aniline dyes are being used and technical education is doing much to educate the crofters in dyeing, spinning and weaving, but much of this old style yet remains.

A peculiar characteristic of these Harris tweeds is the peat smoke smell, caused by the fabrics being woven in the crofter's houses, where there is always a strong smell of peat reek, peat being the material they burn in their fires. As weaving a length of fabric takes these hand-loom weavers a long time, the cloth becomes impregnated with this peaty smell, which remains a characteristic of these fabrics. But what are the mills in the borders of Scotland doing but imitating even this smell in their so-called "Harris" tweeds, and giving their fabrics the flavor of the genuine article by keeping them in chambers wherein peat has been burned.

Enclosed I send you a few specimens to let you see the sort of stuff these original handmade Harris tweeds are. The industry has been maintained solely through the efforts of many of our nobility and aristocracy to help these islanders and the people in poorer

districts in the North of Scotland. The fabrics being worn by the highest in the land at once became fashionable and accordingly were much copied. Spurious articles purporting to be the genuine stuff are now only too common, and it is a pity to see the industry intended for the poorest people in these barren and comfortless islands taken away by less deserving imitators. But of course in commerce this can't very well be avoided. There is no room for sentiment in business.

In these tweeds there is an immense amount of wear, indeed there is no wearing them out, the wool is so strong and wiry. The light colored specimen sent marked "St. Kilda Tweed" is an interesting specimen as made

HARRIS TWEED.

on the lonely island of St. Kilda standing out in mid-ocean. The island being barren and wild and devoid of any shrubs and heather for making dyes the crofters have to content themselves without dyestuffs, hence their fabric is the natural color of the wool.

I enclose you a printed article by Her Grace the Duchess of Sutherland, who is the president of the Association. She and other titled ladies do all in their power to aid this home industry. The perusal of it may interest you as it explains the objects of the association better than I can do.

HIGHLAND HOMESPUN.

By the Duchess of Sutherland.

In regard to the occupation of our Highland peasants, artistic ideas must, in a sense, become subservient to practical ones. Throughout wild, rocky regions, such as are met with in the Islands of Lewis and Harris, the people are fighting for the bare means of subsistence, and are constantly faced with the problem of not how life is to be enlightened, but how life is to be lived.

As things stand at present the men go out to sea, but fishing means always a precarious livelihood; they cannot be agriculturists, for they have no land to cultivate, and they are unlikely to be anything but ignorant and superstitious, with their churches wrung by theological squabbles, and their school education, though moving forward, still of the most primitive kind. To the tourist, the inhabitants of the Hebrides are a study, to the sportsman an encumbrance, and to the world in general but names associated with the bagpipes, Dr. Johnson's Tour, or the later story of the deer raid. Strong facts about over-population and lack of means of subsistence, excite little curiosity or sympathy, and although only the rolling Minch separates the island from the mainland, their people might, for all that is understood about them, be dwellers in an alien country.

The Scottish Home Industries Association, 132 George St., Edinburgh, is striving to throw light into dark places—to bring some understanding of the ways and needs of these Highlanders and Islanders before an indifferent public—and in a measure it has succeeded. In the last few years some notice has been taken of, and some admiration expressed at, the bales of soft-hued cloths which through various charitable agencies have been sold in the south. In coloring and texture they differ vastly from the cheaper goods of the English factories, and this having been remarked upon, enquiries were instituted as to how and where they were produced. To understand the details and difficulties of the production of homespun goods needs a personal inspection of the houses of the workers, an introduction to their family life. Those who have been able to accomplish both, marvel at the patient industry and the keen sense of color and texture displayed by the women who work at the tweed. In some parts of Lewis, and in the greater part of Harris, the spinning and weaving is done entirely by women. The men, from a paucity of opportunity, a narrowness of outlook, have grown lethargic, and those who are not fishermen have little to occupy them in tending their plots of cultivated land called "lazy-beds," lying on the rocky mountain side.

But the women are never idle. Within their small heather-roofed dwellings—that look like mole-heaps risen from the earth—half blinded and stifled by peat smoke, they sit and spin all the day

long. In the corner, the loom, of primitive construction, takes up as much room as a four-post bed; the cat sleeps under it and the chickens roost upon it with homely familiarity. The blackened pots by the chimney corner contain the roots and herbs gathered from the hill-side to form the native dye-stuffs, and when the cloth has passed through all the processes of spinning, weaving and dyeing—on one of the rare sunny days of the west—may be heard the strange crooning of a Gaelic melody as the women sit singing and "wauking" the web with their feet.

CARDING AND SPINNING FOR HARRIS TWEEDS.

In every township in Lewis and Harris three-quarters of the inhabitants depend for their livelihood upon the making and selling of this tweed, and more desperately, as time goes on, do they realize the difficulty of disposing of it, and the small payment it brings them in. The manufacturer of the south, in his hideous factory laughs at the very attempt to keep the industry alive; but if it is allowed to die, if the Government brings forward no equivalent employment for these people, what is to happen? We cannot contemplate the starvation and misery to which they would be exposed; rather by the very discouragement are our energies increased to keep the trade thriving, and to insist on gaining for it the approval and patronage of the rich.

That the cloth is expensive is no reason for its neglect. This rage for cheapness threatens to have as serious an effect upon the country as the passion for luxury. Fair work demands a fair wage, and a good article its price, and that the consumer and the producer should be brow-beaten by the middleman cannot for an instant be allowed. The production of hand-made cloth is of necessity a more costly process than the production of cloth in steam mills, but the material has an intrinsic value of its own—it possesses style, originality, warmth, and durability, and these attributes are enough to plead its cause with the men of means. There is hardly a sportsman at the present day who does not prefer home-spun tweed to any other, if his tailor has the indulgence to supply him with it, and he must be firm as to this preference, for to be dictated to on such a question by those who reap so much benefit from clothing us, is out of the question. The public should insist upon obtaining the tweed—trade-marked by the registered trade-mark of the Association—not only at sales at smart Houses in London, but through the usual channels of trade, otherwise the Association is crippled in its efforts by those who compete with it, and who sell the cloth below cost price rather than not dispose of it at all—a fatal plan of action from an economic point of view for the workers.

It would be easy to write many sentimental pages on the atmosphere of the industry. To paint pictures of the stormy skies, the raging seas, the mountains and the moors, amongst which it fights for its existence; to tell quaint tales of the old woman's gratitude for bales sold, bales which she had tramped many weary miles, in her pride, to carry to the local agent, or sad stories of the widow's tears, who had thrown away long hours and sleepless nights in the manufacture of an unsalable pattern. But this is a practical paper for a practical purpose, and I can only, in conclusion,

add an expression of the keen interest I have felt, and shall always feel in the work, all the keener, I may say, if I could gather together in this cause those who love our Highland people as they deserve to be loved, and who are determined that no effort shall be relaxed till they win the fair reward of their labor.

You will observe that the correct use of the term Harris tweed is confined to these genuine hand made fabrics made by the crofters and in buying such we should be very careful that we get the real stuff. Such can only be obtained through the Home Industries Association and perhaps a few well known high class tailoring establishments. I hope this account of the Harris tweed industry will prove of some little interest to you and if so I shall be most happy.

French Worsted Spinning.

VII.

BY A FRENCH TEXTILE ENGINEER.

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TWISTING.

This is one of the most important operations of worsted manufacturing. It gives a definite appearance to the yarn to suit the purpose for which the yarn is to be used. For men's wear goods two or three-ply yarn is used. The single strands comprising the ply yarn are often of contrasting colors, such as white twisted with black to give a gray appearance, or a worsted thread twisted with a thread of another material, as silk, cotton, ramie, etc., in order to obtain certain effects or to reduce the cost by the use of a material costing less than wool.

Usually ply yarn for men's wear is twisted fairly hard in order to give the fabric what is called grain, that is to say, to make it handle somewhat sandy or granulated. On the other hand much less twist is given to the yarn when it is desired to have it handle soft and spongy. There is, therefore, no fixed rule for determining the number of turns of twist per inch for yarn of a given size, as it all depends upon the particular appearance desired in order to satisfy the demands of fashion, which change from season to season. Nevertheless while disclaiming any intention of formulating a fixed rule for determining twist, yet a general rule can be made which, though rather vague, can be used for determining the amount of twist to be used in two and three-ply yarn in order to obtain the maximum of strength or stability. By stability we mean the quality of not kinking in either direction. The following rule serves for this particular purpose:

Rule for twisting two or more ply yarn for obtaining the maximum of strength and stability: The twist in the ply yarn should be equal to one-third of the twist in the single strand. It is understood of course that the direction of the twist in the ply yarn is always the reverse of that in the single yarn.

Example: How many turns of twist should be given to a 2-ply 36's having 9 strands per inch in the single yarn, in order that there may be no tendency to kink in the ply yarn, and so that when a weight is suspended at the end of the ply yarn it will not turn in either direction?

$9 \div 3 = 3$, turns per inch in the ply yarn.

Example: A 3-ply yarn is to be made from a single yarn having 12 turns per inch. How many turns should be given to the ply yarn to obtain the maximum of strength?

$12 \div 3 = 4$, turns per inch.

These examples will be sufficient to illustrate the general rule which must be accepted with many exceptions, as at best it affords but a rough approximation of the twist required.

Knitting and embroidery yarns are made by twisting from three to eight single strands together. Very little twist is given to the ply yarn, just sufficient to hold the strands together. The direction of the twist in the ply yarn is always the reverse of that in the single yarn. Usually the yarn used for embroidery and knitting is made from long wool.

Yarn is twisted either on a mule or throstle frame. There are two kinds of throstle frames: the ring twisting frame, Fig. 23, similar to the frame used in spinning, and the flyer frame, Fig. 24, which is similar to the flyer frames used in the twisting process, the bobbins being turned by the yarn and supplied with a brake in order to regulate the tension of the thread.

The use of the mule for twisting is limited to yarn made from very short wool to be used in weaving. Long wool intended for knitting, embroidery and passementerie, being twisted very soft, works but poorly on the mule because of the great length of yarn suspended in the air and twisted during the passage of the carriage outward. These last named yarns are, therefore, always twisted on the throstle frame. The flyer frame is used for very long and coarse wool which has a tendency to become fuzzy and make the yarn shaggy. A smoother yarn is obtained with this class of wool on the flyer frame. In the great majority of cases, however, the ring frame only is employed and gives excellent results as regards production and quality.

The ring twisting frame differs but little from the ring spinning frame, the only difference being in the use of one pair of smooth metal rolls of large diameter in place of three pairs of corrugated rolls. The yarn is unwound from the large bobbins, formed on the doubler and placed in the rack of the twisting frame. It then passes through the delivery rolls to the stop motion, which serves to stop the rolls and consequently the delivery of the yarn whenever the thread breaks between the rolls and the spindle. This stop motion prevents much waste and keeps the loose broken ends from running on to the adjoining strands, causing coarse threads. From the stop motion the yarn passes over a pig tail guide to the traveler and is then wound on the bobbin.

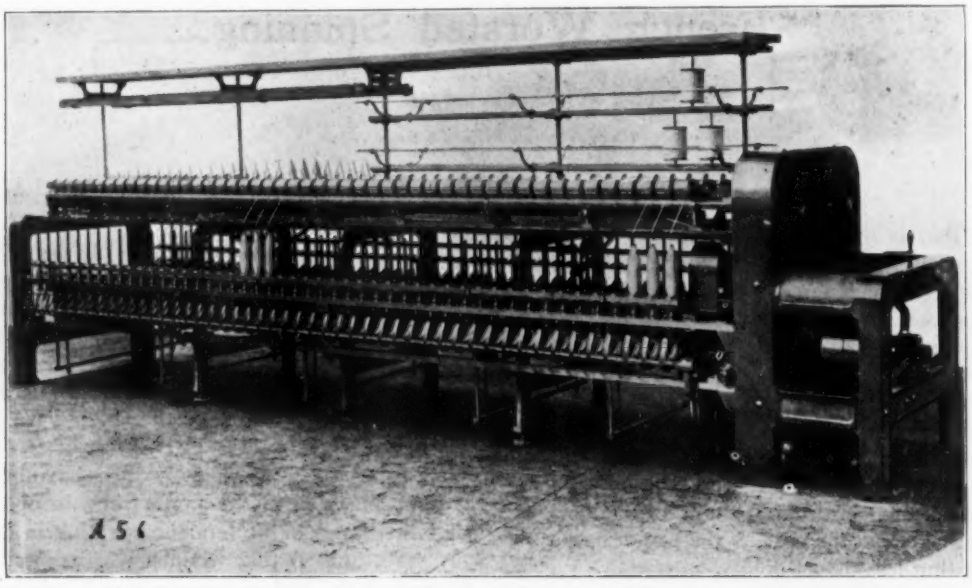


FIG. 23. A RING TWISTING FRAME.

Each spindle of the ring frame is provided with a friction device by which it can be stopped by a slight pressure of the operator's foot or knee. When the yarn has been previously prepared on the doubler for twisting, the twister is much more complicated than is the machine already described. It is necessary in that case to use the stop motion for each individual strand composing the ply yarn so that in place of one stop motion it is necessary to have from two to six of them for each ply thread. This arrangement is necessary

because the spindle and the delivery of the strands composing the ply thread must be stopped whenever one of the strands breaks. If the delivery of one strand is stopped while the spindle continues to revolve the spindle will twist the yarn rapidly and soon break it, necessitating the splicing of all the threads composing the ply thread. This splicing involves much hand work and causes many knots and defects in the cloth.

Notwithstanding the many complications that may arise by not using the doubler, this method of twisting without the doubler has been extended greatly during recent years in order to reduce the cost of manufacturing to a minimum.

What we have said regarding stop motions applies not only to ring frames, but also to fly frames and mules. The mule not being used for doubling more than two strands at one time need not be equipped with the arrangement for stopping the spindle; in fact, the construction of the mule makes the application of such a device impossible.

(To be continued.)

Sea Island cotton is native to Pernambuco and was sent to Georgia as seed in 1786.

ENGLISH TEXTILE SCHOOLS.

Leeds, Eng., Dec. 20, 1903.

Editor Textile World Record:

The Yorkshire College in England is very extensive and the textile department is all in one building. The College at Manchester, Eng., occupies several buildings, each of which is devoted to a special branch of cotton manufacture.

In the English schools the course of study for each year is divided into three terms,

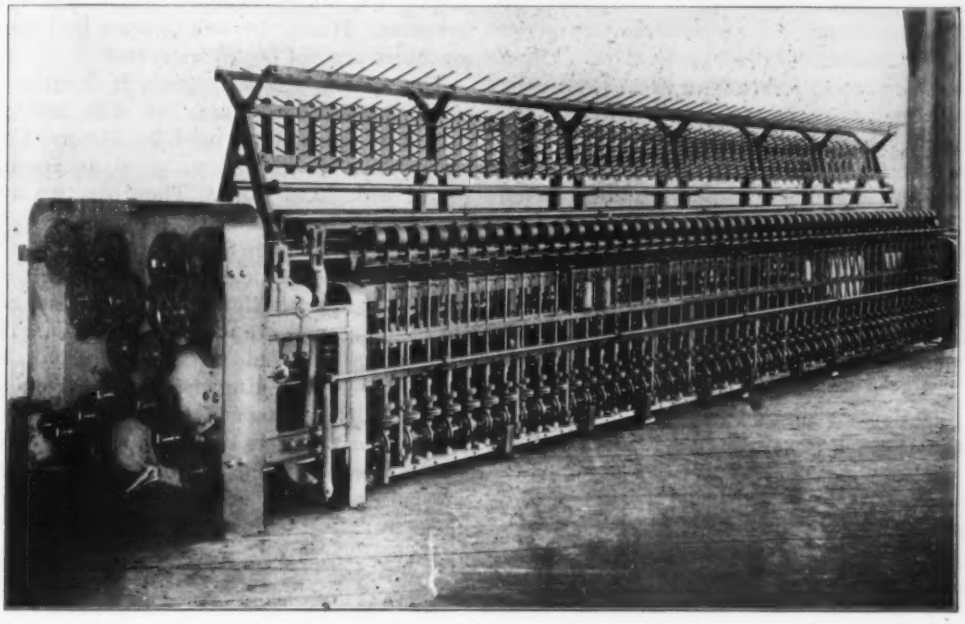


FIG. 24. A FLYER FRAME.

while in the American there are but two.

The Yorkshire College of Leeds is specially adapted for woolens and worsteds. Very little cotton is used except for union goods. The worsted spinning department is very well equipped. The wool scouring and backwashing machines are probably the only ones not found in the American school. Still the college has not the variety of spinning machines that is found at the Lowell school. The cloth finishing room is fairly well equipped, but the machines are not of the latest types. A large number of woolen and worsted power looms are found at the college.

The chief difference between this college

and the American schools is in the method of instruction. In America the students do all the manual labor, while in the college, men are employed for the heaviest and dirtiest part. All the lectures except those on spinning are given by the professor.

In American textile schools, the lectures in each branch are given by the instructor or professor of each department. By the latter system the students obtain the ideas of several and not of one or two individuals only. One important feature of the English schools is that all the ranges woven on the power looms are cut up and samples given to each student with all particulars. These have been found to prove of great use to the graduates, as they can refer to them any time they so desire. There is one drawback, however; with few exceptions all the fabrics woven on the power looms are constructed in the designing department. The students should be allowed to design some of the ranges, for practice, if not for any other reason. In American schools some fabrics are designed by the instructors and others by the students, which is probably the best principle.

YANKEE.

MACHINES FOR CUTTING VELVETEEN.

Amiens, France, Jan. 5, 1904.

Editor Textile World Record:

All the machines used in the Amiens district for cutting velveteen are of English origin, but since their introduction they have been greatly improved by the Amiens manufacturers. These improvements have made the machines stronger and capable of doing better and more work.

Velvet cutting machines may be divided into two classes:

1. Machines with straight knives.
2. Machines with circular knives.

The results with machines of the first class are equal to hand work. The knife is similar to that used by the hand workman, but is shorter and is held in position by the attendant. The piece is carried forward by foot power. One cut is made at a time and it is necessary to repeat the operation as many times as there are cuts in the width of the piece.

With some machines the cut is completed from one end of the piece to the other before changing the position of the knife. In other cases the cutting is done in lengths of about twelve yards and the width of the piece is cut for that distance before continuing the operation lengthways. The former method is used by Messrs. Cocquel and Hagimont. The machines are English, but I have been unable to learn the name of the builder. Originally these machines were equipped with four knives, but on account of the difficulty of adjusting the knives exactly the cut was very irregular. It may be well to state that these machines are not highly esteemed.

The latter method by which lengths of about twelve yards are cut with straight knives at one time is used by Messrs. Cosserat. The results are as good as are obtained with hand work. They use two systems:

(a) Machines with fixed knives.

(b) Machines with movable knives.

Seventy-five machines of the first class and six of the second are used by this firm. The machines with fixed knives originally came from Manchester, England, having been introduced by a company who supplied them to the manufacturers on a royalty.

This company failed to make them work well and numerous improvements have been made by Messrs. Cosserat since the patents expired. These improvements are trade secrets known only to the Cosserats, but they relate to the knives and the methods of stopping and starting the machine. This machine is open to the objection of being very heavy and requiring about 10 H. P. for its operation. The work is perfect.

Machines with movable knives are also used by Messrs. Cosserat and resemble the Armstrong machines very closely. Once placed in position the knife is carried forward the length of the table and then moved successively sideways by an endless chain till the whole width of the piece is cut. Another table length is then cut in the same way. This machine requires very little power and the results are as good as with the machine previously described.

The cutters with circular knives are used for cutting corduroys by Sutcliffe, Cocquel,

Descat, Hagimont, etc. They belong to the Smith system, but are built at Amiens. The production is very large compared with that of the machines already described.

There are other systems of cutting velvets in use, but never having seen them in operation I am unable to say anything about them. Messrs. Motte have a special machine invented by the overseer of their cutting room. For corduroys the Smith system gives excellent results. The machines require very little power and floor space and the results are better than by the other systems.

GAUL.

FOREIGN SAMPLES.

The publisher of Le Moniteur des Echantillon de l'Industrie Drapiere, Nova Texta, has combined the various editions into one, which will in future be supplied to subscribers, and 552 samples of the latest styles of woolen and worsted dress goods will be furnished every season of six months. Of these samples 300 will be accompanied with weaving particulars. Price for the season of six months, $14.

HAND MADE LACE IN FRANCE.

(From a Report by Hilary S. Brunot, U. S. Consul, St. Etienne, France.)

The manufacture of laces in France dates back to the days of Louis XIV. In the month of August, 1663, the famous "Declaration du Roy" was published, decreeing the establishment in Arras, Rheims, Sedan, Alencon, Aurillac, and other towns in the Kingdom of manufactures of all kinds of thread and needlework, after the manner of the points made at Venice, Genoa, Ragusa, etc. They were to be called "poincts de France" and the decree provided that all such work should be free from duty. In order to encourage the industry in the country, another decree, dated October 12, 1666, forbade any person of any quality or condition to wear, under pain of confiscation of the articles and £1,500 fine, any Venetian or other foreign lace, no matter of what kind. The following year a second decree was issued forbidding the wearing of any dress with silver or gold facings and of lace made outside the country. These decrees also forbade the manufacture or sale of any lace other than that made in the royal manufactories and according to the designs of the directors of the establishments.

Colbert, the minister of Louis XIV, was the chief instigator of these Draconian decrees. He obliged the manufacturers to make only one point of design, to the exclusion of any other. A large number of localities only obtained their living by the kind of lace familiar to them, and everywhere it was believed that the opening of manufactories whence, henceforth, designs were to be issued would cause ruin. But the real aim of the Government establishments had not been understood, which was to perfect the industry, in providing models, designs, and methods of execution, constituting precious elements for the improvement of the ordinary manual work.

For twenty years Colbert had to contend with popular prejudice on the subject, but he finally triumphed, for it was through his efforts that the admirable "poinct de France" took rank among the arts and industries of the Kingdom.

Today, in spite of the progress of machine-made lace in the numerous manufactories of the northern and eastern Departments, the handmade article holds a respectable rank. The lace makers (women) throughout the country not being organized or syndicated after the manner of other workers, it is difficult to state exactly the number of those who work at the industry, but it does not fall short of 200,000. The wages they receive are in general but small, in proportion to the talent and amount of work furnished. There are places where a clever lace maker will not earn, for twelve or fourteen hours' work, more than 30 cents a day.

In the country around Caen, Bayeux and Falaise, in the Calvados, where formerly a great deal of lace was manufactured, the inhabitants have decreased by 27,182. In the same Department in 1851 there were 50,000 lace makers, while in 1875 they had fallen to 30,000. Yet, in spite of the extraordinary improvement in the machines, the lowering of the wages, and the decline of public taste,

the handmade industry holds a good many centres.

Alencon still produces its famous point d'aiguille, which enjoys so much favor and employs so many workers (10,000). Handmade lace is found all along the northern coast—Cherbourg, Honfleur, Bolbec, Fecamp, Dieppe, Bayeux, Falaise and Lisieux. At Honfleur and Dieppe a special kind is manufactured, imitating Valenciennes. But the most active centre is at Bayeux, where Chantilly lace is manufactured.

Flanders, the cradle of the lace industry, has lost much of its prestige, while Lille and Arras produce but a small quantity of cheap grades. For Valenciennes, the town celebrated above all others for the lace art, the nimble fingers have ceased to ply the fuseau for nearly a century, although in certain places, such as Bergues, Cassel, Hazebrouck and Bailleul, an imitation of this fine lace is manufactured.

In the Department of the Vosges and at Mirecourt a very fine imitation of Brussels point is made, and 20,000 to 25,000 women still work therein.

Lace making is the principal industry of the Haute-Loire. The wives and daughters of the farmers are to be seen everywhere, in the most remote villages as well as in the towns, turning the spindle of the cushion, set on their laps, with surprising agility. As we look on, the web is being formed beneath a forest of pins with glass heads of various colors, which mark the loop of the threads, and the charming design furnished by the manufacturer soon appears.

In the Haute-Loire the number of women lace makers is computed at 60,000, while about 30,000 more are scattered through the neighboring Departments. It is difficult to give the amount daily earned by these women, as it varies according to the quality of the lace and the section of the country. Some earn only 10 cents a day and none exceed 40 cents, a sum above the average.

The women of the Haute-Loire seem to be born with the talent of lace making and the intelligence necessary to the interpretation of the designs. From an early age the women, of all classes, are familiar with the "fuseau," and the young girls very quickly learn the mysteries of the "entre-deux," as well as the infinite varieties of "passements" indicated on the card of design. This traditional apprenticeship the women of the Haute-Loire rarely forget. Doubtless when they marry they perform the various home duties willingly, but in their hours of leisure they return to the "cushion" to weave some beautiful pattern.

If you want to see the peasant at her favorite work you must go to the "convegi," which in their patois means a meeting or club of women out of doors in summer, and in the "cabinet" or principal room in the house in winter. Rarely is a woman seen working alone. The group, from which cradles are not excluded, affords a curious spectacle in fine weather. Eight or ten women sit round in a circle in the shadow of some house. The youngest have the face framed in a high frill bonnet, covered with lace and tied with a bright ribbon. Their elders have kept up the old custom—a white cap with a very small felt hat, or "tsapelon," fastened on the top by means of a black ribbon.

All of them hold the lace machine ("carreau," a kind of box lower in front than behind and covered with leather and furnished with a cylinder on which to roll the lace as it is made) on their laps. Each cushion has from six to twenty-eight pairs of spools, or spindles. In winter five or six families meet in a house. In the centre of the room is a round table supporting a very primitive lamp —sometimes a glass filled with colza oil, in which a wick of raw cotton is steeping. All around stand four or five globes of thin glass filled with water; a ray of strong light is thrown by each of these primitive natural reflectors, permitting the women to work till bedtime.

LACE EXPOSITION AT LE PUY.

The picturesque city of Le Puy organized this summer a local exhibition of art in which lace held an important place. The lace exhibition was divided into two sections—ancient and modern. In the former were found very rare specimens lent by Paris houses and private families. Among these I remarked guipure of Venice, Milan lace, point de France Louis XIV, point d'Alencon made for

Napoleon I, a magnificent handkerchief of Marie Antoinette, etc.

The modern section was composed almost entirely of the product of this region, consisting of fancy handkerchiefs, corsages, sleeves, collars, cuffs, appliques for dresses and hats, bed toilets, cushion and pillow covers, curtains, tablecloths, etc.

In another room were exposed a considerable variety of looms, from the humble carreau (cushion) to the most complicated machine representing the latest expression of modern improvement.

A large number of visitors were attracted to this exhibition, and it is believed that this industry, so long vegetating in the Haute-Loire, will receive a considerable impulse from the interest shown in the exhibition.

LACE MAKING IN THE PUBLIC SCHOOLS.

Before closing this report, I must add that the French Government, recognizing the importance for the country of the development of the lace industry, has passed a bill through the Chambers, instituting the professoriate of handmade lace in the public schools of Departments where lace is manufactured and also in the normal schools of the same.

Further, special district technical schools for improving the artistic education of the work girls and designers are about to be opened in certain centres.

FOREIGN TRADE IN COTTON AND COTTON GOODS.

In the twelve months of 1903, we imported 63,196,016 lbs. cotton, nearly all of it being Egyptian. This was 25 per cent. less in weight than for 1902, but owing to the increase in cost from 12 6/10 to 15 4/10 cents per pound, the total valuation for 1903 was but 10 per cent. less than for 1902. This shows that the rise in the price of cotton, while adding immensely to our wealth because of the large exports, results in a slight change against us on account of the cotton imported. The amount is comparatively small, however.

The value of the cotton goods imported last year was $52,713,664, as compared with $48,954,355 in 1902 and $41,019,955 in 1901. Nearly one half of last year's imports of cotton goods consisted of laces, embroideries, etc. Knit goods came next with $6,064,066.

Turning to the exports we find that the raw cotton sent abroad last year amounted to 3,622,847,431 lbs., valued at $378,573,628, or 10.45 cents per pound, this is practically the same weight as in 1901, when we exported 3,553,378,841 lbs., valued at $300,985,383, or 8 1/2 cents per pound. The increase of about 2 cents per pound in the value of the cotton exported last year increased the total value by nearly $72,000,000.

Our exports of cotton goods last year show a decrease as compared with 1902. Last year we sent abroad cotton goods to the value of $27,131,950, as compared with $33,274,907 in 1902. The decrease was due to the decline of the trade with China from $16,048,455 in 1902 to $8,801,964 in 1903. Doubtless this shrinkage in the Chinese trade was due to the rise in the price of cotton, which necessitated an advance in the low priced fabrics bought by the Chinese.

Cuban Cotton.

Several tons of cotton have recently been shipped from Havana by the steamer Mobile. The cotton was of the sea island variety and marks the beginning of what may be an important industry in Cuba. It is believed that the rich Cuban soil and the climatic conditions on the island are very favorable for the growth of sea island cotton. La Discussion, Havana, reports that there are over 30,000 acres at present planted with cotton and that the shipment above mentioned will be followed by other and larger ones in the near future. The Cuban government and the Cuban Cotton Company are supplying cotton seed free of charge to planters throughout the island, who wish to engage in cotton raising.

Byssus is the name of the long, delicate filaments attached to the shell of a mollusk of the same name. These threads grow to a length of two feet and are remarkably long and silky. They are worked after the manner of flax and made into a variety of small articles, chiefly gloves and stockings.

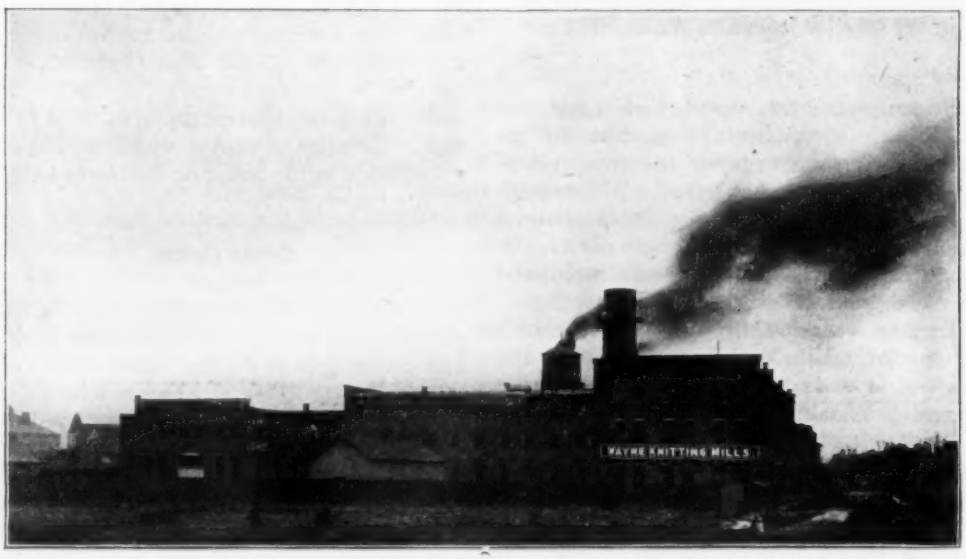
A Western Knitting Mill.

THE WAYNE KNITTING MILLS, FORT WAYNE, IND.

The Wayne Knitting Mills of Fort Wayne, Ind., were established by Theo. F. Thieme in 1891, soon after the passage of the McKinley Bill, starting in a very small way in narrow rented quarters in a store room, and against the strongest opposition of foreign manufacturers and local prejudices in favor of imported hosiery. Dealers were soon convinced of the merits of "Wayne Knit Matchless" Hosiery, and in 1892 the company built and equipped a plant of their own, installing imported machinery such as was used in the most progressive European factories, and employed skilled knitters, many of whom had been trained in the best foreign mills. This plant has been enlarged from time to time until today it consists of brick buildings covering 116,000 square feet and having three floors, giving employment to nearly eight hundred people making nothing but hosiery.

In 1901 they issued their children's stockings under a new trade-mark, calling them "pony stockings," and by unique and well directed advertising made them so well known that today the Wayne Knitting Mills is believed to have a larger output than any other hosiery factory in the United States, their product being sold in every state in the Union.

On May 1, 1902, the United Knitting Mills, a factory organized by Mr. Fred Thieme, a brother of the founder of the industry, was merged with the Wayne Knitting Mills, making a combined capital of $425,000. This factory was situated on an adjoining site and had been selling their output through the older company.

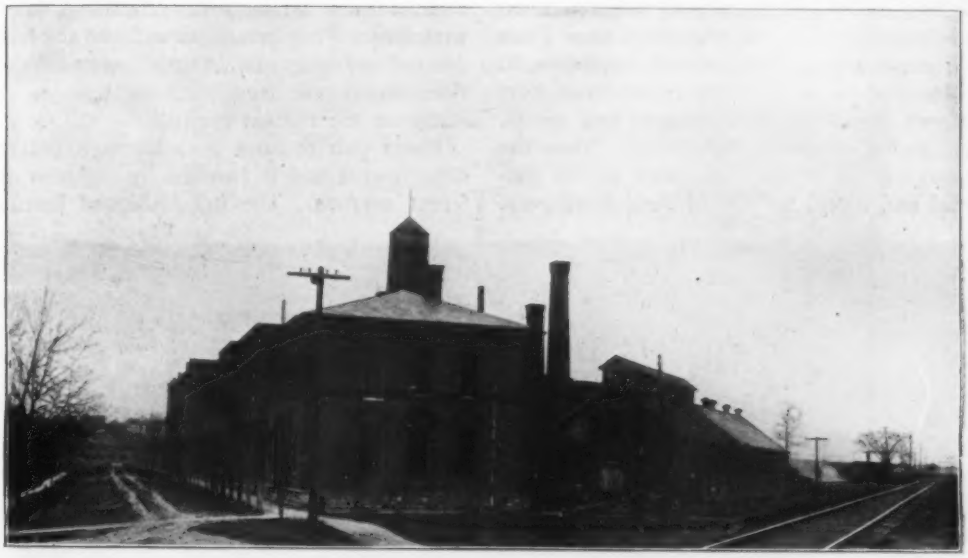


THE WAYNE KNITTING MILLS.

The intelligent and progressive class of labor found there makes Fort Wayne a very desirable place for the industry. Laboring men in this city are very thrifty. They own their own homes. They are usually of foreign extraction, especially German. The services in many of the larger churches are conducted in German, and it has been the work of the pastors to urge all laboring men

to do their duty toward their employers and by all means to avoid strikes. Strikes in Fort Wayne are almost unknown.

All the good old German societies are represented here, and the Wayne Knitting Mills have erected and furnished a beautiful club



OFFICE OF THE WAYNE KNITTING MILLS.

ONE OF THE LARGE KNITTING ROOMS.

room and dining hall combined with a fully equipped stage, etc.; the operatives of the factory have organized a dramatic club, a singing society, etc., and give numerous entertainments. The management also gives the employees a free annual excursion to Robison Park, a beautiful resort near Fort Wayne, at which time they have field sports, etc., and a very enjoyable outing. Thus the managers are always interested in the material and moral welfare of their employees.

A CORNER OF THE DINING ROOM.

The equipment of the Wayne Knitting Mills is of the best, the machinery is of the latest and most improved patterns. Experienced foremen are retained in each department and the ventilation, lighting and heating are subjects of special attention. The buildings are of standard make and fireproof as far as it is possible to make them. They have their own lighting plant, and although the water of Fort Wayne is excellent they have installed a water purifying system of their own and in addition to the fire protection afforded by the city have their own fire fighting company and apparatus.

The company has always been progressive, and endeavor to keep their business in the first rank. They are continually on the lookout for anything new in their line, adding to their equipment from time to time as the styles on the market require.

Every pair of hose goes through thirteen departments and is handled by eighteen different persons. The full fashioned knitting machines are very large and intricate and seem almost alive as the yarn carriers fly back and forth knitting the web, sometimes using two threads and again three, sometimes one color and again three or four colors according to the pattern desired.

The dye house of the Wayne Knitting Mills constitute a model institution in itself. The dye is one of the most important features of good hosiery. Daily inspection of the dyes used here are made to insure perfection and even results.

Long and Short Chain Dyeing.

BY ROGER WILLIAMS.

Three systems of dyeing warps in the chain are used in the United States, the long chain or Scotch system, the short chain, and the Fries system. It will be asked what are the essential differences between these systems, and which is the best and most economical to use.

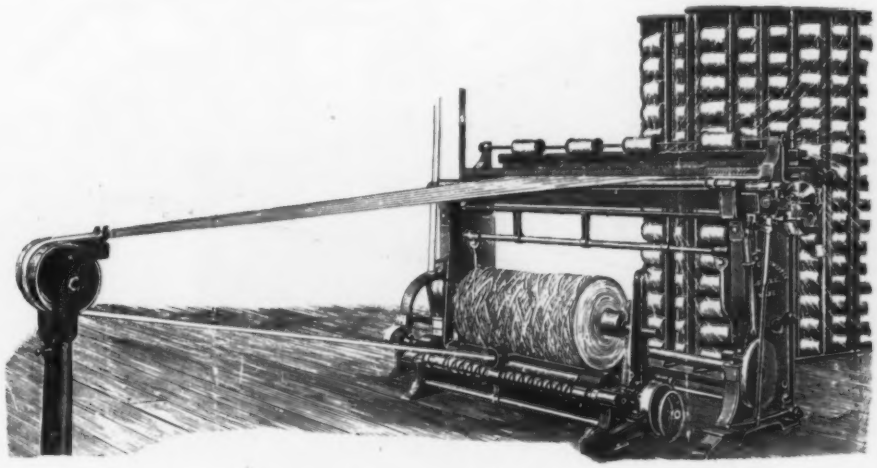


FIG. 1. BALL WARPER FOR LONG CHAIN DYEING.

The long chain system consists of ball warping, boiling out the warps, doubling on a doubler, dyeing in a round tub, and after the warps are split again into their original length, drying and beaming on a long chain beamer, and then slashing on loom beams.

The short chain system consists of ball warping, boiling out, dyeing, drying and starching, again drying, and then beaming on loom beams by the copper and hack systems of beaming, or on a hand dressing frame.

By the Fries system the chains are ball warped and dyed without boiling, then run directly out of the dye bath on the dryer, similar to the method of cloth printing.

For the long chain system the warps are usually warped on a ball warper, each warp having from two to five hundred ends and being from 5,000 to 15,000 yards in length. Fig. 1 gives a good idea of the warper used for this class of work.

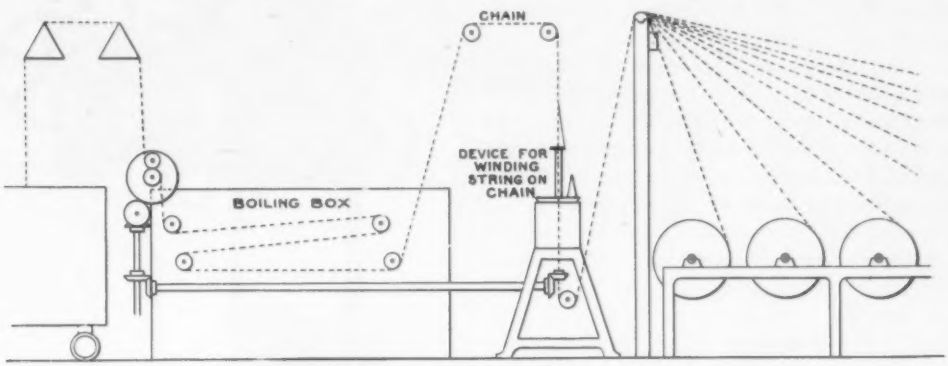


FIG. 2. BOILING OUT BOX FOR LONG CHAIN WARPS.

The warps are sent to the dyehouse, where they are boiled out, and while entering the

boiling box a thread is wound around each warp at intervals of from six to nine inches to prevent slacks and kinky yarn in the subsequent processes, and thus ensure less broken warps and less cost in beaming. Fig. 2 shows a boiling out box with the Draper Co.'s thread winding attachment. The thread winding machine is of simple construction and is so made that the spool of thread revolves around the warp as it is unwound and enters the boiling box. As the warps are boiled out they are carried over a reel and put into cans similar to roving cans used on railway heads or drawing frames.

A warp 15,000 yards in length will usually have fifteen leeces, or one leece every thousand yards. Such warps are put into fifteen cans for the purpose of doubling, as it is called in the dyehouse. This doubling process is the "shortening of the warp" by folding it into thousand-yard lengths, in order to save time in dyeing. For example, a warp of 200 ends, 15,000 yards long, would be doubled so that in dyeing it would be equal to 3,000 ends 1,000 yards long, thus shortening the dyeing to one-fifteenth of what it would otherwise have been.

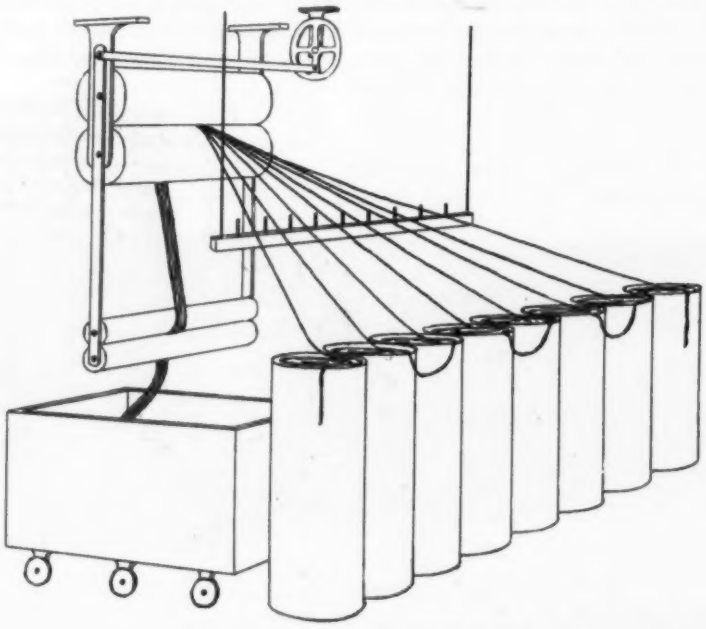


FIG. 3. DOUBLING LONG CHAIN WARPS.

This doubling can be done either by hand or machine, but generally a machine is used. This machine consists of a pair of rollers to being doubled into a box or a pile on the draw warps from the cans, and with a swinging, folding motion to fold the warp after

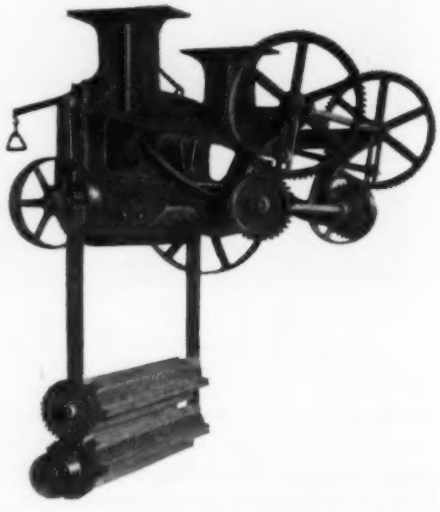


FIG. 4. A LONG CHAIN DOUBLING MACHINE.

floor. Fig. 3 will give an idea of how this folding is done.

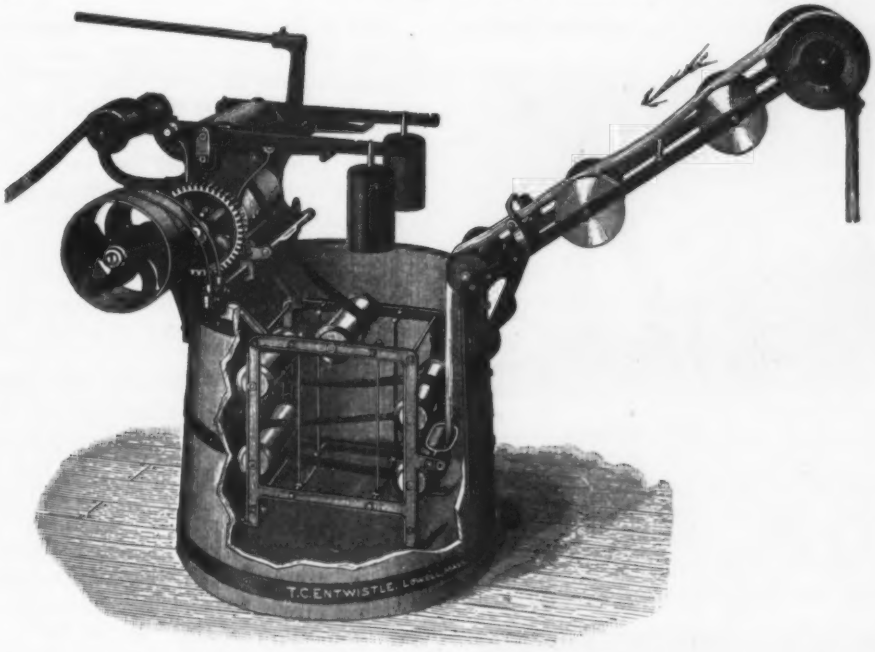


FIG. 5. ROUND TUB DYEING MACHINE.

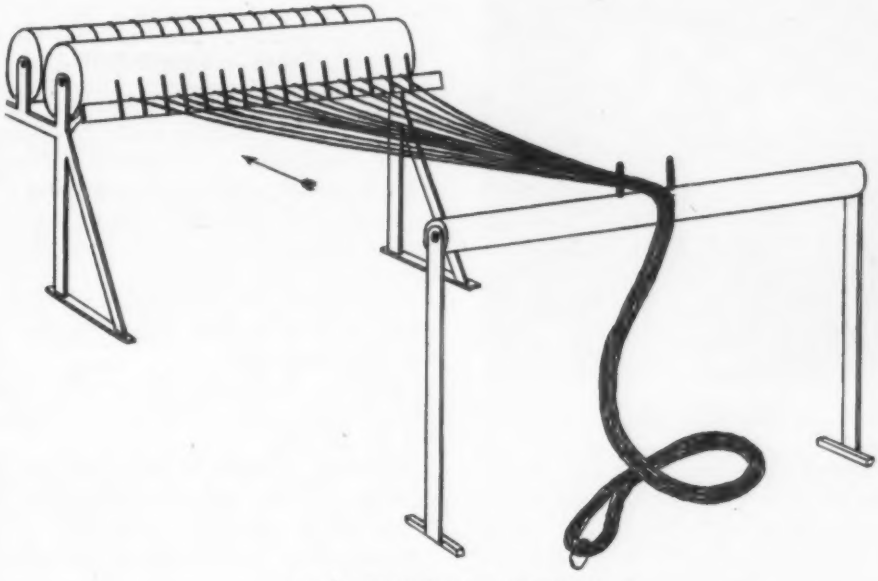


FIG. 6. SPLITTING LONG CHAIN WARPS.

The cans containing the warp are placed behind the doubling machine, and every other in size. This is done so the doublings will all draw the same way. Then the operator takes a leece in the chain so that when the chains can is inverted into a can that is a little larger

are again split into the original length they will not be crossed up. Fig. 4 shows a doubling machine without warp.

After being doubled the warps are dyed in

FIG. 7. LONG CHAIN SPLITTER.

the round tub, Fig. 5, or what is known as the Scotch machine, from its having originated in Scotland. This machine is fitted with a skeleton frame which can be hoisted out of the dye liquor in case of accident or

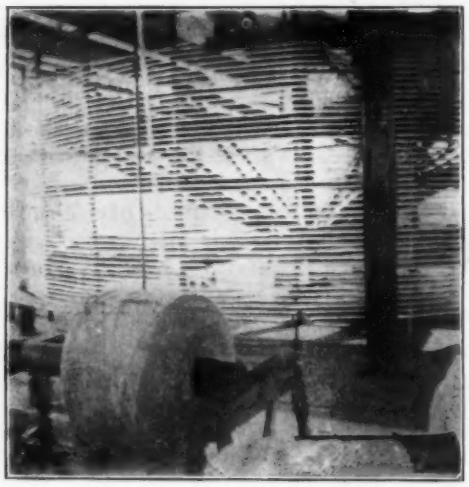


FIG. 8. LONG CHAIN WARP DRYER.

when steeping in sumac. The top squeeze roll is fitted with a lever which is used to raise the roll as the end of the warp is drawn through. The warp of itself would not raise the roll, so it is raised by the attendant to save the warp from being cut. As will be seen from the cut there is no delivery reel as on short chain dyeing machines, and the attendant in the front of the machine draws the warp and folds it hand over hand at the same time.

After dyeing the warps are taken to the splitter, where they are again split out into original lengths in order that they may dry well. This is done by passing the warps over a roll and putting each strand of the warp between two pins, under one reel and over the other reel of the splitter and run into cans again. After the warp is split every other can is once more inverted and the warp is in its original form and ready for dyeing. Fig. 6 illustrates the method of splitting long chain warps. Fig. 7 illustrates a long chain splitter without warps.

After being split the warps are dried on drying cylinders. These are of tinned iron or copper and have safety valves to prevent the pressure from getting too high. The warps are wound over the cans, are guided by pins and go in at the ends and come out at the centre. Some dryers dry four warps at one time, others two, according to the width of the cylinder and the weight of the warp. The cylinders are generally driven by a small engine at a speed of 40 to 75 yards per minute. Fig. 8 shows a dryer and will give some idea of the method used to dry warps.

(To be continued.)

Wages in French Mills.

A commission appointed by the French government has recently made an inquiry as to the conditions in the textile industry in order to decide whether the reduction of the working hours from 10 1/2 to 10 per day on April 1, as provided by the present statute, is advisable. The statement of the textile workers before this commission gives the following interesting data regarding the wages paid in French mills:

Weavers. 60 to 70 cents per day; in some mills 80 cents to $1. Apprentices receive one-half the full rate.

Spinning. Piecers, 60 cents per day; spinners, $1. A few mills pay piecers 80 cents; spinners $1.20; back boys get from 25 to 40 cents per day; twisters and spoolers 50 cents per day.

Combing. Women, 40 to 50 cents per day; men, 50 to 60 cents per day.

Laborers, 5 to 7 cents per hour.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

WOOL SCOURING.

(Continued from January.)

Having considered the various chemical processes used in cleansing the wool fibre, together with the action of the different chemicals, let us next look at the mechanical appliances used.

These are of great importance, for the cost of wool-scouring depends not only on the chemicals employed, but also on the method of handling the wool. We have already seen to what extent the fibre can be injured by the improper application of various chemicals, and this is also true to some extent of the mechanical treatment it has to undergo in the scouring process. There is no doubt that some methods employed leave the wool in a much better condition than others.

It is, we may say, impossible not to injure the fibre to some extent, but as it is necessary to remove the dirt and grease, the problem to be solved is to accomplish this at the least expense consistent with leaving the fibre in the best possible condition.

Having decided upon the chemicals and the strength of the solution to be used, the next question is, How can we best apply them?

There are different distinct methods of scouring wool by machinery in use, the machines being constructed to produce the result either by agitation in the scour liquor and then squeezing, or by steeping with the least possible agitation and then squeezing.

The machine used in the first method is known as the swing rake machine, a machine of somewhat older construction, yet frequently met with, and in which the wool is passed through a long bowl, fitted up with swing rakes, which agitate and pass the wool quickly through the scouring liquor and up to the lifting apparatus, and so further forward up to the squeezing rollers. The agitation given by the swing rakes greatly assists in loosening and getting out the sand and dirt and other extraneous matter while the wool is passing through the scouring process. This machine, however, only should be used for wool not liable to be injured by the agitation in the scouring liquor, although the difficulty can be somewhat overcome by moderating the speed of the rakes, however, we must remember that the wool in the scouring bowl is always considerably distributed by swing rakes during its passage through the scouring liquor, a feature which always has a tendency to more or less felt the fibres, which in scouring, if possible, should be obviated. As will be readily understood, wool scouring is more of a chemical than a mechanical operation, for which reason it is desirable to bring the scouring liquors into contact with the wool with as little mechanical disturbance as is possible. The swing rakes always more or less act to thus disturb the wool, hence the disadvantages of this machine when dealing with wools which easily felt.

The most general methods of using these machines is to have a "set" of three machines following each other in continuous line, the wool dropping from one machine into the other. The first machine contains the scouring liquor, the second a considerably weaker scouring liquor, say about one-third the alkaline strength of the first machine or bowl and heated to about half its temperature. The last machine or bowl contains nothing but cold water, supplied by a 1 1/2 to 2 inch pipe, kept continuously running while the machine is at work, so as to constantly renew the water in the bowl of the machine. An overflow is placed at the opposite end of the bowl to that of the inlet pipe, to allow the water to run off as it becomes dirty, thus providing always clean water for the third bowl.

This rinse water in the third bowl should be as pure and soft as possible, for if it is hard, any soap left in the wool is decomposed, forming the insoluble lime soaps previously spoken of, and which render it very difficult to dye even shades, and also have a tendency

to render the color less fast and more liable to rub off.

Omitting the second bowl or machine, i. e., using one bowl or machine only for scouring purposes and then dropping the wool directly into cold water immediately after leaving the squeezing rollers from the hot scouring liquor of the first machine is too sudden a change for the wool fibres, it chills them and sets any remains of grease that may still be left in it. By using a second scouring bowl, as previously explained, all this chance of trouble is obviated, since any remainder of grease in the wool after the latter leaving the first bowl or machine gets loosened in going through the second machine, and after passing through the squeezing rollers of this second machine the wool may be let fall into the cold water of the third machine and get a thorough wash without any damage to the fibres.

The heat of the scouring liquor in the first bowl should, in an average, on no account be allowed to exceed 120 deg. F., which is a point that cannot be too carefully guarded against, for wool, as mentioned once before, while under the influence of alkalies, as during scouring, is very injuriously affected by great heat. Each machine has a set of squeezing rollers at the delivery end, and outside the delivery end of the last machine there is placed a small beater, which revolves quickly and beats open the wool as it emerges from the squeezing rollers of the last machine. In small woolen mills where only a one bowl machine is required, this swing-rake kind is most frequently met with, being mills which have to get along with it by varying the speed of the rakes to suit the length and condition of staple of the wool under treatment.

In another and superior make of these wool scouring machines a series of rakes, formed into a rake frame are made to move very slowly through the scouring liquor, thus passing the wool through the machine in a gentle manner in bulk without agitation or disturbance. When the rake frame reaches the end of the bowl, close to the squeezing rollers, it is lifted bodily, by means of the chains and pulleys, clear out of the liquor and travels back to the forepart of the bowl to commence the journey over and carry the wool another stage farther along the bowl towards the squeezing rollers. The wool is thus acted upon until arriving at the delivery end, when it passes between the squeezing rollers and is thrown off by the flyer.

Similar to the previously explained make of machine a single passage through such a machine is usually not sufficient to thoroughly cleanse the wool, since after being in use for a short time the liquor becomes very dirty. It is a frequent practice, therefore, to have two or three machines through each of which the wool passes. The second trough or bowl is filled with clean scouring liquor, and the third with water. When the liquor in the first trough or bowl becomes saturated with yolk or too dirty for use, it is run out and the trough filled with that from machine No. 2; the latter being supplied with clean liquor. As there is usually a large amount of insoluble matter removed from the wool which would collect on the bottom of the bowl and contaminate succeeding lots, this danger is largely overcome by providing each bowl with a perforated false bottom, through which the larger part of the dirt falls out of the way and can be easily removed when necessary. In some machines, besides the overhead movable rakes, there is also a series of stationary swing rakes, suspended in the bowl, which must aid very much in opening out the wool, but at the same time is apt to increase the danger of injury to the fibre.

An arrangement for still further cleaning the wool is as follows: A perforated pipe is attached to the upper portion of the carrier, and from it a constant shower of the scouring liquid is poured down upon the wool just before it enters the squeeze-rolls. In this way some of the impurities which have escaped being removed in the bowl may be removed here and the wool left in a better condition for the next bath.

METHOD OF HEATING THE SCOURING LIQUOR.

Each bowl as a rule is supplied with a steam pipe, but if all the heating is done with this, there is great danger of overheating some portions of the scouring liquor and thereby injuring the fibre, while other por-

tions may not be heated enough to act effectively on the dirt and grease. A better way is to supply the bowls with water from a tank kept at the desired temperature, and when any slight additional heat can be obtained from the steam, without much danger.

Another method of scouring wool is accomplished by flushing the wool through a tube, trough, or cistern, by the scouring liquor, up to the squeezing rollers, without feeding a second time. By this procedure the wool is lightly held together in bulk while the scouring liquor is forced through it. The wool is thus conveyed evenly and regularly forward without disturbance to the squeezing rollers at a much slower speed than the scouring liquor flowing in the same direction. The sand and dirt fall from the wool through the brass perforated plates, and can be flushed away at the will of the operator to any independent receiver.

The use of hard waters for scouring purposes is always very detrimental, but this is specially the case when soap is employed, either alone or with an alkali. The injurious effect arises from the formation of sticky and insoluble lime and magnesium soaps, which adhere to the fibre, and give rise subsequently to defects; either causing dirty spots to appear upon the finished goods if white, or serving to attract or repel the color during the dyeing process, thus producing unevenly colored goods. This is probably one principal reason why old scouring baths act more efficiently than freshly prepared solutions, as the lime, etc., in the water will have been precipitated when first used. Another cause for the better action of old baths is probably to be found in the fact that being in a state of slight fermentation the liquor more readily emulsifies the fatty matters.

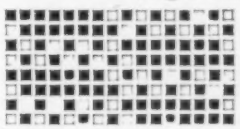
A German method of wool scouring is that by means of water-glass (silicate of soda). In this process care must be taken not to have the temperature either of the water or of the water-glass higher than that of the soap-and-soda bath as used in connection with the scouring of wool previously explained. Add water-glass only, but no soda or soap, to the first bath in which the wool is steeped. Into the second bath put one-half soda and one-half water-glass. It is advisable to previously squeeze out the liquor before the wool is finally rinsed in the third bowl, because by keeping this wash liquid warm it can be used twice as long as soda or soap liquor. Wool washed with water-glass always appears white and open. It is also soft to the feel when it is squeezed out well before being finally rinsed. It is claimed that in this condition it is much cleaner, can be more quickly and better dyed, and becomes much whiter when sulphured.

Another German process is as follows: The sorted wool is steeped in a receptacle provided with two compartments. When one portion of the wool has been steeped sufficiently—three hours being ordinarily required—it is placed in the washing machine and passed through two compartments filled with water of a successively higher temperature, until the cleansed and scoured wool reaches another receptacle filled with cold water, in which it is rinsed. When rinsed clean, the wool is caught up by an apparatus raising it from the water, and it is passed between two rollers, which squeeze out the water. It is then caught in a tender, whizzed in a hydro-extractor, and finally dried in a strongly heated and well-ventilated chamber. The dirty, heavy raw wool is by this operation transformed in a comparatively short time into a white, well-dried staple, and is perfectly clean.

THE CONSTRUCTION OF BEDFORD CORD WEAVES.

(Continued from January.)

STANDARD TEXTURES FOR BEDFORD CORD I.E. PIQUE FABRICS.

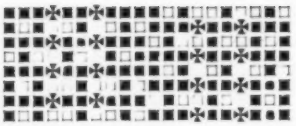


Weave Fig. 27.

Repeat of weave 16 × 4. Six harness fancy draw.

Warp: 2640 ends, 30's cotton, 27½ inches finished width, 12 cords per inch, no stuffer warp.

Filling: 76 picks of 36's cotton per inch. This arrangement represents about as low grade of a Bedford cord as is to be found in the market.



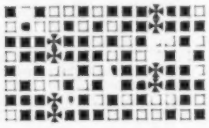
Weave Fig. 28.

Repeat of weave 20 × 4. Six harness fancy draw.

■ type = face warp, ✣ type = stuffer warp.

Warp: 3250 ends, face 30's cotton, stuffer 2/30's cotton, 26 inches finished width, 25 cords in two inches.

Filling: 70 picks per inch of 40's cotton.



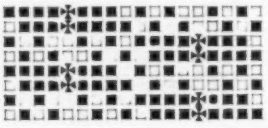
Weave Fig. 29.

Repeat of weave 14 × 4. Six harness fancy draw.

■ type = face warp, ✣ type = stuffer warp.

Warp: 4230 ends, face 30's cotton, stuffer 2/20's cotton, 27½ inches finished width, 22 cords per inch.

Filling: 122 picks per inch, 40's cotton. This represents the most closely corded effect possible.



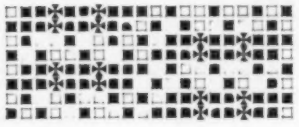
Weave Fig. 30.

Repeat of weave 18 × 4. Six harness fancy draw.

■ type = face warp, ✣ type = stuffer warp.

Warp: 3935 ends, face 30's cotton, stuffer 2/14's cotton, 26½ inches finished width, 33 cords to every two inches.

Filling: 148 picks per inch, 40's cotton.



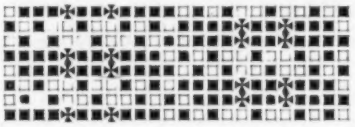
Weave Fig. 31.

Repeat of weave 20 × 4. Six harness fancy draw.

■ type = face warp, ✣ type = stuffer warp.

Warp: 3842 ends, face 40's cotton, stuffer 2/20's cotton, 26½ inches finished width, 29 cords to every two inches.

Filling: 152 picks per inch, 40's cotton.



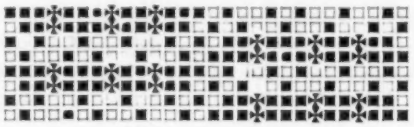
Weave Fig. 32.

Repeat of weave 24 × 4. Six harness fancy draw.

■ type = face warp, ✣ type = stuffer warp.

Warp: 4130 ends, face 30's cotton, stuffer 2/14's cotton, 26½ inches finished width, 13 cords per inch

Filling: 130 picks per inch, 40's cotton.



Weave Fig. 33.

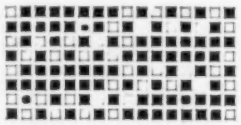
Repeat of weave 28 × 4. Six harness fancy draw.

■ type = face warp, ✣ type = stuffer warp.

Warp: 4230 ends, face 50's cotton, stuffer 2/24's cotton, 27½ inches finished width, 11 cords per inch.

Filling: 256 picks per inch, 100's cotton. Texture thus given refers to about one of the highest priced staple Bedford cords in the market.

With reference to a worsted dress goods (in plain bright colors) the following lay out will produce a good result.



Weave Fig. 34.

Repeat of weave 16 × 4.

Warp: 4400 ends, 2/36's worsted, 48 inches finished width, 23 cords to every two inches.

Filling: 80 picks per inch, 80's worsted. We must mention that in connection with worsteds the stuffer warp so characteristic to cottons is not required on account of the felting quality of the floating pick during scouring the flannel; said floating pick will contract in itself and thus produce a raised effect to the rib or cord portion without requiring a stuffer warp. Again the finish of the worsted Bedford cord is

totally different from those made of cotton, the former being simply scoured, singed and ready for the market, and thus the Bedford cord effect

Fig. 35

kept intact, in fact heightened, a feature not the case with cottons where starching and calendering — but for the presence of a stuffer warp — will tend to depress the cord effect in the fabric.

JACQUARD EFFECTS.

Bedford cord weaves are also used in connection with jacquard work, for worsted and cotton dress goods as well as for white vestings, etc.

Fig. 35 is a sketch applicable in connection with Bedford cords and plain weaving for worsted dress goods. The figure, leaves and stems, to be Bedford cord effect, centre pointed twill effect; the ground common plain weave.

Fig. 36 shows a portion of this jacquard design (the lower left-hand corner) executed on point paper.

Fig. 37 shows a fabric sketch for a white piqué jacquard dress goods. In the same, the ten vertical stripes in each effect to be Bedford cord weave (using a stuffer warp in this case). The figures as shaded diagonally, to be filling, floating on face of fabric. Stuffer warp to float below figure portion of stripe. White portion of figure within compass of stripe to be plain weave. Ground to be piqué weave, i.e., using a binder warp, now and then, interlacing in the filling, the remainder of the time resting on back of the structure, the interlacing of this bind warp producing the characteristic lines width.

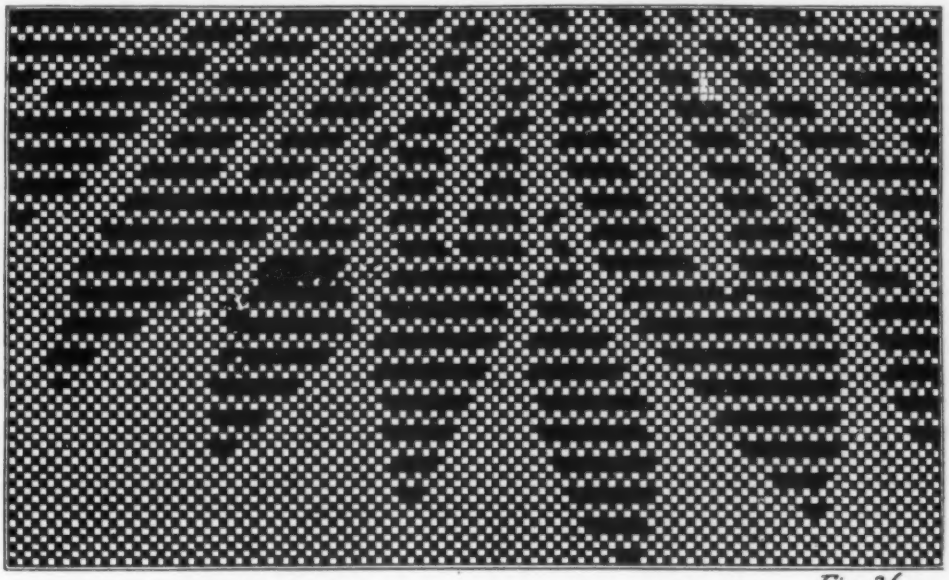


Fig. 36

ways, i.e., in the direction of the filling in the fabric.

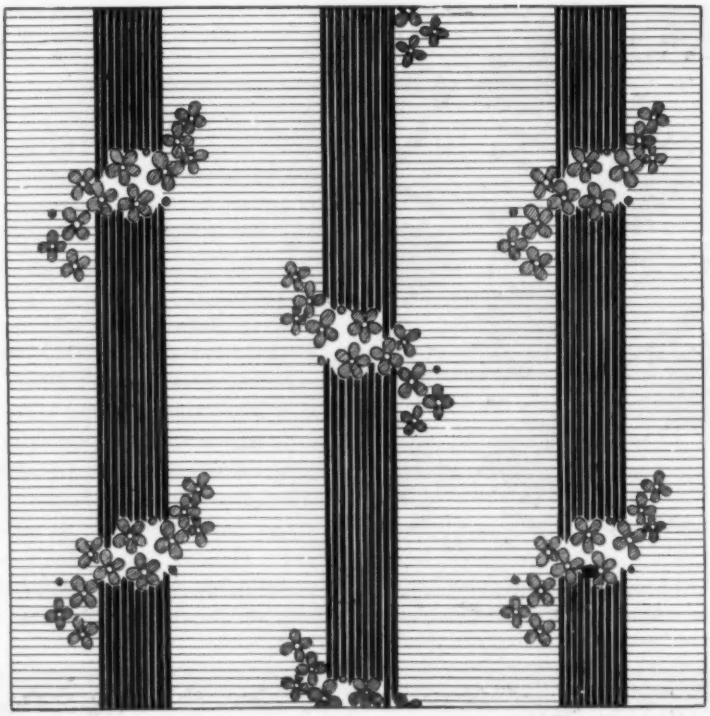


Fig. 37

In 1774 England passed a law prohibiting the export of machinery used in cotton manufacture.

PLAIN AND FANCY GINGHAMS.

(Continued from December.)

THREE COLOR EFFECTS.

In our former article, as mentioned above, we explained the construction of stripes and check effect of ginghams in two colors. We will now continue the article in connection with three color effects, and from which it will be easy for the reader to extend the affair to any number of colors at his command.

In Fig. 13 we show a three color stripe gingham, one repeat of the effect equals 9/16 of an inch. This fabric sketch, in connection with a texture 42 × 42, is produced by means of dressing the warp thus:

6 ends light
6 ends medium
6 ends dark
6 ends medium

—

24 ends in repeat of pattern, in order to produce the effect in Fig. 13 actually in fabric.

In connection with a better texture, 56 × 56, use the following dressing:

8 ends light
8 ends medium
8 ends dark
8 ends medium

—

32 ends in repeat of pattern.

For a still better texture, for example, 86 × 86, use:

12 ends light
12 ends medium
12 ends dark
12 ends medium

—

48 ends in repeat of pattern, in or-

der to produce fabric sketch Fig. 13 actually in the finished cloth.

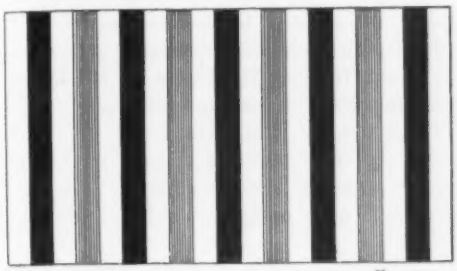


Fig 13

Fig. 14 shows us another three color effect calling for the same repeat of pattern as the one before. In connection with warp texture of 42 ends per inch use the following dressing:

6 ends dark
6 ends medium
12 ends light

24 ends in repeat of pattern.

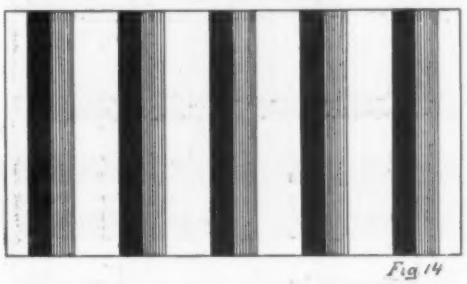


Fig 14

In connection with a medium texture, say for example, 56 warp threads per inch use:

8 ends dark
8 ends medium
16 ends light

32 ends in repeat of pattern.

If required to reproduce fabric sketch Fig. 14 in connection with a high warp texture, in a fine fabric, say for example, 86 warp threads per inch, use:

12 ends dark
12 ends medium
24 ends light

48 ends in repeat of pattern, 9/16th of an inch wide.

Another gingham stripe is given in diagram Fig. 15, one repeat of the pattern calling for 3/4 of an inch, and which effect in connection with a texture of 42 warp threads per one inch can be produced with the following dressing:

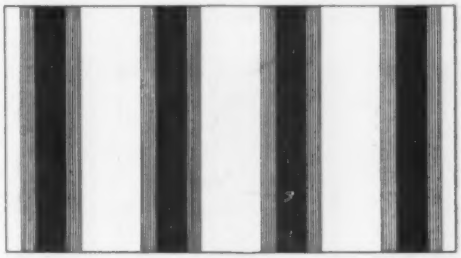


Fig 15

4 ends medium
8 ends dark
4 ends medium
16 ends light

32 ends in repeat of pattern.

If the effect in question has to be produced with a better texture, say 64 warp threads to one inch, then use:

6 ends medium
12 ends dark
6 ends medium
24 ends dark

48 ends in repeat of pattern.

For extra fine textured fabrics, for example, 85 warp threads per inch, use:

8 ends medium
16 ends dark
8 ends medium
32 ends light

64 ends in repeat of pattern, in order to produce the effect given, actually, in the fabric.

Fig. 16 calls for a neat double stripe effect in two sizes, calling for one repeat of pattern in 1 1/16 inches, and which effect in connection with a low texture, for example, 43 warp threads per inch is produced with the following dressing:

4 ends medium
8 ends dark
4 ends medium
12 ends light

2 ends medium
2 ends dark
2 ends medium
12 ends light

—

46 ends in repeat of pattern, in order to produce the stripe effect given in Fig. 16, actually, in the finished cloth.

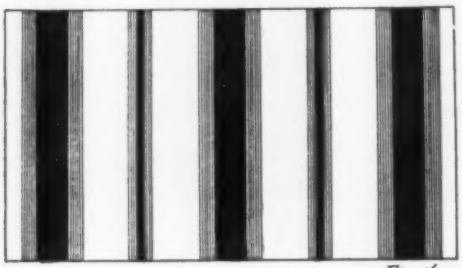


Fig. 16

For a better grade of fabric, for example, with 64 warp threads per inch, use the following dressing:

6 ends medium
12 ends dark
6 ends medium
18 ends light
3 ends medium
3 ends dark
3 ends medium
18 ends light

—

69 ends in repeat of pattern, in order to produce stripe effect given, in finished fabric.

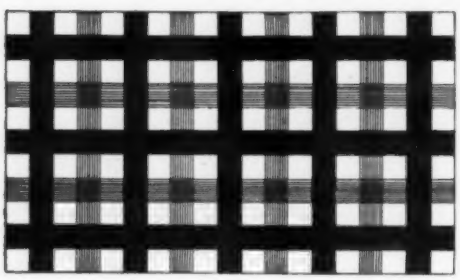


Fig. 17

If required to reproduce the sketch in connection with an extra fine fabric, say for example, 86 warp threads per inch, simply double each item as given in connection with the first mentioned dressing for Fig. 16, in order to produce the required effect in the finished cloth.

We will now give the lay out for 2 checks. Fig. 17 calls for a repeat of the effect in 9/16th of an inch, and which in connection with a texture of 43 × 43 calls for the following arrangement of warp and filling:

6 ends light
6 ends medium
6 ends light
6 ends dark

—

24 ends in repeat of pattern, warp and filling ways, in order to produce the effect given in Fig. 17 actually in the fabric. In connection with a warp and filling texture of 57 × 57 use:

8 ends light
8 ends dark
8 ends light
8 ends medium

—

32 ends in repeat of pattern, in order

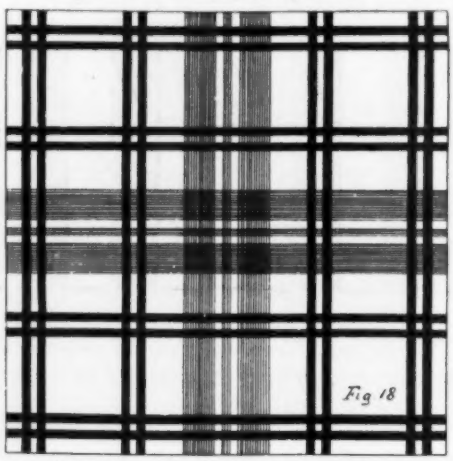


Fig 18

to produce the required effect in the fabric. Using 10 ends for each set of threads in place of 8 ends used in the arrangement given before, will require a texture of 71 × 71 in the fabric, in order to produce effect Fig. 17 actually. Using 12 ends in this manner for each effect in the check, will in turn call for a texture of 86 × 86.

Sketch Fig. 18, repeating on 1 11/16 inches, in connection with a texture of 43 × 43 calls for the following arrangement of warp and filling:

2 ends dark
2 ends light
2 ends dark
20 ends light
2 ends dark
2 ends light
2 ends dark
10 ends light
8 ends medium
2 ends light
2 ends medium
2 ends light
8 ends medium
10 ends light

74 warp threads and picks in repeat of pattern, in order to produce with texture given, the effect Fig. 18 actually in the fabric.

In connection with a better texture, say, 65×65, use the following arrangement of warp and filling:

3 ends dark
3 ends light
3 ends dark
30 ends light
3 ends dark
3 ends light
3 ends dark
15 ends light
12 ends medium
3 ends light
3 ends medium
3 ends light
12 ends medium
15 ends light

111 warp threads and picks in repeat of pattern, in order to produce effect required.

Should you have to deal with an extra high texture, for example, 86×86, then simply double the number of threads of the first arrangement of warp and filling given in connection with dressing for this pattern in order to produce the required size of check in the fabric.

BRUSSELS AND WILTON CARPETS.

(Continued from January.)

Fig. 4 shows such a wire, which, after having been placed in the shed of the loom, as if it were a filling thread, is thus covered by the two hundred and fifty-six (or whatever number the texture (pitch) of the fabric may be) warp threads, and then a comparatively thin hempen, jute, or cotton pick (ground filling) is passed across; thus a series of loops are formed over and around the wire, and it is woven into the fabric as though it were a thick filling thread, and intended to form a coarse corded or rep-like fabric. Wire after wire is thus covered by the pile warp threads and woven into the fabric, till twenty or more

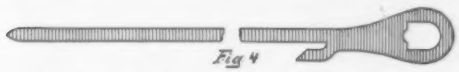


Fig 4

rows of loops have been formed around the wires, when the wire, which was first covered by loops, is automatically withdrawn by a hook which catches in its looped end. Another set of loops is formed in front, and another wire is withdrawn behind, and the affair thus continued; but during the process of weaving, a sufficient number of wires are always kept in the last-formed portion of the fabric in order to keep the loops intact, i. e., prevent them from being pulled out.

Thus it is now clear that when a thread of pile yarn is not active in the formation of the figure, it is covered or concealed by the wire and ground picks of filling.

Each class of pile threads interweave with the ground pick on the same system, producing a carpet of uniform strength, and one in which every species of pile is equally permanent.

Brussels carpets are woven upon the double shed principle, the wire forming the loops being inserted at the same revolution of the crank shaft of the loom as when the shuttle is thrown for inserting the ground or body (hemp, cotton or jute) filling. There are three different warps found in the Brussels carpet, viz.: the pile warp c, the body or ground warp k and the stuffer warp g (see Fig. 3). The first mentioned warp of course is operated by the Jacquard harness, the second by means of two common harnesses n, n′ and the third either by 1 or 2 common harnesses j, or from spare needles of the Jacquard. Warps number 2 and 3 are carried upon two common beams, l and h respectively, placed at the back of the loom. The face warp, only, consists of worsted

yarn, the ground or body and the stuffing warps being of cotton, linen or similar material, as is also the filling.

The pile warp c as forming the face of the carpet is wound upon small bobbins b, placed upon the frames of the creel a, as is clearly shown at the back of the loom in our illustration Fig. 3. The frames in the creel vary in number according to the quality of the carpet. For what is known as a "five-frame carpet" five frames in the creel are necessary; for a "four-frame carpet" four frames in the creel are required, and for a "three-frame carpet" three frames in the creel. Sometimes, however, a variation in the pattern causes the use of a sixth frame in the creel for the making of a five-frame fabric, a similar increase in the number of frames in the creel being sometimes necessary in the case of a three or four-frame fabric; the reason for it being that some Brussels carpets are "planted."

For instance, the nature of the design may be such that only very small quantities of one or more colors are visible in some portions of the design, and which should be "stopped out" by substituting some of the other colors. There would, therefore, be a certain number of ends vacant, that is, a certain number of bobbins of yarn of one or more colors would be saved. The same number of bobbins might be placed upon the sixth creel, and thus an extra effect of color would be obtained in the design. This "dodging" of color is, however, oftener resorted to in three and four-frame carpets, four or five creels thus being used. It is by no means an uncommon occurrence in a three, four, or five-frame fabric to "stop out" portions of color in any one frame and to abstain from introducing a corresponding amount of color in another place. The result of this is that a certain quantity of yarn is saved, and the general effect of the design is little, if any, the worse for the saving.

In the best grades of five-frame Brussels carpets in the market as a rule the standard pitch is 256 ends, this number of ends (loops) showing upon the face in the width (27 inches) of the fabric, but, in reality, this number (256) of ends must be multiplied by five, in connection with a five-frame carpet, = 1280 ends, the latter number representing the full number of ends of pile warp threads employed in the construction of this fabric, plus the necessary body or ground and stuffer warp threads. There are, therefore, with reference to the pile warp, 256 bobbins of yarn upon each of the five creels. In connection with a four-frame, the affair would equal $256 \times 4 = 1024$ ends = full number of pile warp threads to be used in such a carpet, etc.

Through each dent in the reed o, one end of each color of the frame is drawn plus two ground or body warp threads and the stuffer warp, thus with reference to a five-frame carpet there are no fewer than eight ends in each dent of the reed.

THE JACQUARD MACHINE

employed in connection with weaving Brussels carpets varies from those regular or common wire hook machines as used for weaving upholstery goods, table covers, dress goods, etc., in that in the Jacquard machine as used for weaving Brussels carpets, in most instances, there are no wire uprights or hooks in this machine, their places being taken by cords, yet the result is the same, the necessary warp threads being raised as required. However, machines have been also made in which wire uprights were employed, but those mostly used have cords, in place of the uprights, worked by needles, precisely as in the common Jacquard. The card cylinder is of hexagonal (6 sides) shape. There is a "lifter board," situated towards the top of the Jacquard, perforated with holes corresponding with the number of needles employed, which raises the tail cords to which the cords of the Jacquard harness are attached. The "lifter board" is placed so as to impart a tilting movement to the Jacquard harness and in turn to the warp threads, in order to produce a clear top shed. The comber board rises and falls by the aid of a lever and a cam as fixed to the main driving shaft of the loom. The object of this is that in weaving a five-frame carpet, four frames, according to the exigencies of the pattern, may be lifted out of the way, so that the shuttle may pass for the purpose of binding

the fabric. There is no spring box used in connection with this string Jacquard, the needles being pushed back at every pick of the pattern by means of a back board, actuated by gravity, the same as used in connection with an Ingrain carpet Jacquard.

Three sets of Jacquard cards are required for a three-quarters (27 inches) wide carpet. When a greater width is required, an extra set of cards is used for each quarter of a yard in the width of the fabric, for which reason a yard wide carpet will require four sets of cards, etc. The more sets of cards to be used, the larger the Jacquard must be, the more needles, tail cords and harness cords are required. One harness cord, heddle, mail and lingo is required for each pile warp thread.

THE WIRE MOTION.

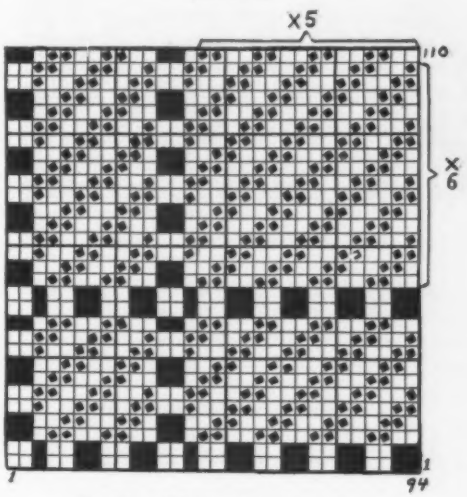
The wire motion is a very important mechanism of the Brussels carpet loom, it being situated at one end of the loom, and has for its object to actuate several long wires (see Fig. 4) upon which the loops of the fabric are formed. These wires vary from 31 to 31 1/2 inches in length. Wires for weaving Wilton carpets, and which will be dealt with later on, are slightly shorter on account of the knife end, varying from 30 1/2 to 31 inches in length.

The number of wires used, in connection with the motion, at weaving, varies, as a rule, from 26 to 28, covering about three inches of fabric being employed. Suppose 26 wires are employed and the loom is working, and the 26 wires have been operated upon, that is to say, 26 loops or picks of the pattern have been formed. The twenty-sixth wire being operated upon, the loops of the fabric being formed upon the wire, then at the same moment this has been done, the first interwoven wire in the set is automatically drawn out of the fabric, and, when quite clear, passed forward and inserted in position, that is, taking the twenty-seventh position of a wire in the fabric, and upon this wire the next pick of the pattern is formed. This feature is repeated over and over again, every one of the twenty-six wires in turn being inserted over and over again.

(To be continued.)

NOVELTIES FROM FOREIGN SOURCES.

Woolen Melton Suiting.



Complete Weave. Repeat 94 × 110.

Warp: — 2,550 ends.

Reed: — 12½ { 1 dent @ 2 ends; 3 dents @ 3 ends; 1 dent @ 2 ends; 27 dents @ 3 ends } = 69½ inches wide in reed.

Dress: —

2 ends, 2/24's worsted, black and green, twisted with 5 run woolen yarn, black ..... = 2 ends.
9 ends, 2-ply 6 run woolen yarn twist, dark blue ..... = 9 ends.
2 ends, 2/24's worsted, black and green, twisted with 5 run woolen yarn, black ..... = 2 ends.
13 ends, 2-ply 6 run woolen yarn twist, dark blue ..... = 13 ends.
1 end, single 32's worsted, black, twisted with 2/80's cotton, white ..... = 1 end.
1 end, 2-ply 6 run woolen yarn twist, dark blue ..... = 1 end.
1 end, single 32's worsted, black, twisted with 2/80's cotton, white ..... = 1 end.
45 ends, 2-ply 6 run woolen yarn twist, dark blue ..... = 45 ends.
1 end, single 32's worsted, black, twisted with 2/80's cotton, white ..... = 1 end.
1 end, 2-ply 6 run woolen yarn twist, dark blue ..... = 1 end.
1 end, single 32's worsted, black, twisted with 2/80's cotton, white ..... = 1 end.
2 ends, 2-ply 6 run woolen yarn twist, dark blue ..... = 2 ends.
1 end, 2/24's worsted, black and red, twisted with 5 run woolen yarn, black ..... = 1 end.
3 ends, 2-ply 6 run woolen yarn twist, dark blue ..... = 3 ends.
1 end, 2/24's worsted, black and red, twisted with 5 run woolen yarn, black ..... = 1 end.
10 ends, 2-ply 6 run woolen yarn twist, dark blue ..... = 10 ends.

Repeat of pattern: 94 ends.

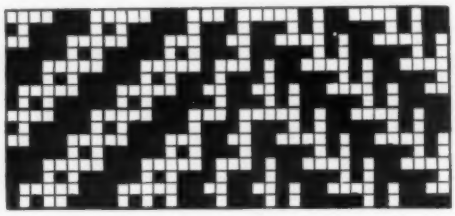
Filling: — 45 picks per inch, arranged thus:—

2 picks, 2/24's worsted, black and green, twisted with 5 run woolen yarn, black ..... = 2 picks.
9 picks, 2 ply 6 run woolen yarn twist, dark blue ..... = 9 picks.
2 picks, 2/24's worsted, black and green, twisted with 5 run woolen yarn, black ..... = 2 picks.
82 picks, 2-ply 6 run woolen yarn twist, dark blue ..... = 82 picks.
1 pick, 2/24's worsted, black and red, twisted with 5 run woolen yarn, black ..... = 1 pick.
3 picks, 2-ply 6 run woolen yarn twist, dark blue ..... = 3 picks.
1 pick, 2/24's worsted, black and red, twisted with 5 run woolen yarn, black ..... = 1 pick.
10 picks, 2-ply 6 run woolen yarn twist, dark blue ..... = 10 picks.

Repeat of pattern: 110 picks.

Finish: — Melton finish, scour well, full slightly, shear clear, press, 56 inches finished width.

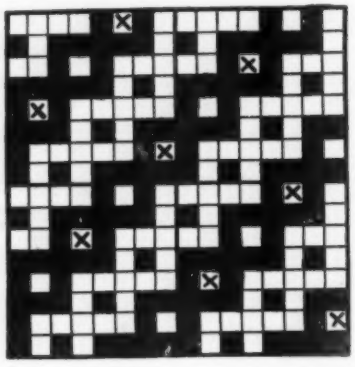
Worsted Melton Piece Dye.



Complete Weave. Repeat 36 × 8.

Warp : — 6,750 ends, all 2/48's worsted, in the gray.
Reed : — 16½ × 6 = 68 inches wide in loom.
Filling : — 88 picks per inch, 2\48's worsted, in the gray.
Finish : — Piece dyed, worsted Melton finish. 56 inches wide.

Worsted Cheviot Suiting.



Complete Weave. Repeat 16 × 16.

Warp : — 5,800 ends.
Reed : — 16 × 6 = 69 inches wide in loom.
Dress : —

2 ends, single 20's worsted cheviot, twisted with 2/80's cotton, white, mercerized ..... = 2 ends.
6 ends, 2/36's worsted cheviot, black ..... = 6 ends.
2 ends, single 20's worsted cheviot, twisted with 2/80's cotton, white, mercerized ..... = 2 ends.
34 ends, 2/36's worsted cheviot, black ..... = 34 ends.
2 ends, 2/48's worsted cheviot, black and blue ..... = 2 ends.
6 ends, 2/36's worsted cheviot, black ..... = 6 ends.
2 ends, 2/48's worsted cheviot, black and green ..... = 2 ends.
34 ends, 2/36's worsted cheviot, black ..... = 34 ends.

Repeat of pattern : 88 ends.

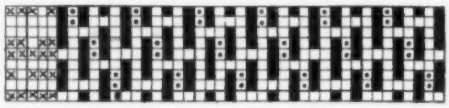
Filling : — 100 picks per inch, arranged thus : —

2 picks, 2/48's worsted cheviot, black and blue.
110 picks, single 20's worsted cheviot, black.

112 picks. Repeat of pattern.

Finish : — Worsted cheviot finish, 56 inches wide.

Worsted Trousering.



Complete Weave. Repeat 42 × 9.

Warp : — 7,672 ends.
Reed : — 19½ { 1 dent @ 5 ends / 5 dents @ 6 ends / 1 dent @ 7 ends } = 65 in. wide in loom.
Dress : —

5 ends, 2/64's worsted, black.
1 end, 2/64's worsted, black, twisted with 2/80's cotton, white.
1 end, 2/64's worsted, black and white twist.
16 ends, 2/64's worsted, black.
2 ends, 2/64's worsted, black and blue-green twist.
15 ends, 2/64's worsted, black.
1 end, 2/64's worsted, black and white twist.
1 end, 2/64's worsted, black, twisted with 2/80's cotton, white.

42 ends. Repeat of pattern.

Filling : — 86 picks per inch, arranged thus:

2 picks, 2/64's worsted, black.
1 pick, 3 run wool, black.

3 picks. Repeat of pattern.

Finish : — Worsted finish, scour well, shear clear, 56 inches wide.

Woolen Cheviot Suiting.

Complete Weave.
Repeat 6 × 6.

Warp : — 2,430 ends.
Reed : — 12½ × 3 = 65 inches wide in loom.
Dress : —

1 end, 3-ply 5½ run, woolen cheviot yarn, blue ..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive ..... = 2 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix .... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white.. }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white .. }
2 ends, single 2½ run, woolen cheviot yarn, olive ..... = 2 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive ..... = 2 ends.
1 end, 3-ply 5½ run, woolen cheviot yarn, brown..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive..... = 2 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix ... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white.. }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white.. }
2 ends, single 2½ run, woolen cheviot yarn, olive..... = 2 ends.
1 end, 2 ply 5½ run, woolen cheviot yarn, white..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive..... = 2 ends.

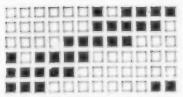
Repeat of pattern : 72 ends.

Filling : — 42 picks per inch, arranged thus : —

1 pick, 2-ply 5½ run, woolen yarn ..... = 1 pick.
2 picks, single 2½ run, woolen yarn ..... } × 31 = 93 picks.
1 pick, 2-ply 4½ run, woolen yarn ..... }
2 picks, single 2½ run, woolen yarn..... = 2 picks.

Finish : — Cheviot finish, scour well, clip on shear, 56 inches wide.

Worsted Suiting.



Complete Weave.
Repeat 12 × 6.

Warp: — 6,670 ends.

Reed: — 15 × 6 = 67 inches wide in loom.

Dress:—

2 ends, 2/52's worsted, black, twisted with 2/80's cotton, slate = 2 ends.
2 ends, 2/45's worsted, black and red-brown twist = 2 ends.
2 ends, 2/32's worsted, green = 2 ends.
6 ends, 2/32's worsted, black = 6 ends.
2 ends, 2/52's worsted, black, twisted with 2/80's cotton, slate = 2 ends.
2 ends, 2/45's worsted, black and blue-green twist = 2 ends.
8 ends, 2/32's worsted, black = 8 ends.
2 ends, 2/52's worsted, black, twisted with 2/80's cotton, slate = 2 ends.
2 ends, 2/45's worsted, black and red-brown twist = 2 ends.
2 ends, 2/32's worsted, violet = 2 ends.
6 ends, 2/32's worsted, black = 6 ends.
2 ends, 2/52's worsted, black, twisted with 2/80's cotton, slate
2 ends, 2/45's worsted, black and blue-green twist
8 ends, 2/32's worsted, black
2 ends, 2/52's worsted, black, twisted with 2/80's cotton, slate
2 ends, 2/45's worsted, black and red-brown twist
8 ends, 2/32's worsted, black } × 8 = 192 ends.
2 ends, 2/52's worsted, black, twisted with 2/80's cotton, slate = 2 ends.
2 ends, 2/45's worsted, black and blue-green twist = 2 ends.
8 ends, 2/32's worsted, black = 8 ends.

Repeat of pattern: 240 ends.

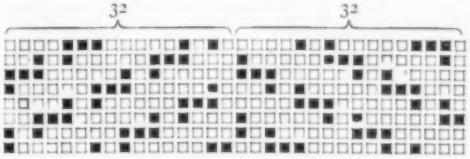
Filling: — 56 picks per inch, arranged thus: —

4 picks, 2/32's worsted, black = 4 picks.
1 pick, 2/52's worsted, black, twisted with 2/80's cotton, slate = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist = 1 pick.
1 pick, 2/32's worsted, green = 1 pick.
3 picks, 2/32's worsted, black = 3 picks.
1 pick, 2/52's worsted, black, twisted with 2/80's cotton, slate = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist = 1 pick.
4 picks, 2/32's worsted, black = 4 picks.
1 pick, 2/52's worsted, black, twisted with 2/80's cotton, slate = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist = 1 pick.
1 pick, 2/32's worsted, violet = 1 pick.
3 picks, 2/32's worsted, black = 3 picks.
1 pick, 2/52's worsted, black, twisted with 2/80's cotton, white
1 pick, 2/45's worsted, black and blue-green twist
4 picks, 2/32's worsted, black } × 19 = 114 picks.
1 pick, 2/52's worsted, black, twisted with 2/80's cotton, white = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist = 1 pick.

Repeat of pattern: 138 picks.

Finish: — Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Suiting.



Complete Weave. Repeat 64 × 8.

Warp: — 7,014 ends.

Reed: — 13 × 8 = 67½ inches wide in loom.

Dress: —

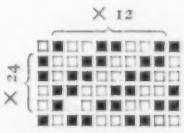
4 ends, 2/36's worsted, black = 4
1 end, 2/64's worsted, black, twisted with 2/80's worsted, pearl
1 end, 2/36's worsted, black and gray } × 2 = 4 } × 6 = 48 ends.
2ends, 2/52's worsted, black and red twist = 2 ends.
2 ends, 2/36's worsted, black = 2 ends.
1 end, 2/64's worsted, black, twisted with 2/80's worsted, pearl
1 end, 2/36's worsted, black and gray } × 2 = 4 } × 5 = 40 ends.
4 ends, 2/36's worsted, black = 4
1 end, 2/64's worsted, black, twisted with 2/80's worsted, pearl
1 end, 2/36's worsted, black and gray } × 2 = 4 ends.
2 ends, 2/36's worsted, black
1 end, 2/64's worsted, black, twisted with 2/80's pearl
1 end, 2/36's worsted, black and gray } × 12 = 48 ends.
2 ends, 2/52's worsted, black and blue = 2 ends.
1 end, 2/64's worsted, black, twisted with 2/80's pearl
1 end, 2/36's worsted, black and gray } × 11 = 44 ends.
2 ends, 2/36's worsted, black
1 end, 2/64's worsted, black, twisted with 2/80's pearl = 1 end.
1 end, 2/36's worsted, black and gray = 1 end.

Repeat of pattern: 192 ends.

Filling: — 57 picks per inch, all plain worsted black.

Finish: — Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Melton Piece Dye.



Complete Weave.
Repeat 98 × 8.

Warp: — 3,570 ends.

Reed: — 15 { 15 dents @ 4 ends / 12 dents @ 3 ends } = 68 in. wide in loom.

Dress: —

25 ends, 2/18's worsted, in the gray = 25 ends.
1 end, 2/40's worsted, in the gray
1 end, 2/10's worsted, in the gray
1 end, 2/40's worsted, in the gray } × 16 = 48 ends.
25 ends, 2/18's worsted, in the gray = 25 ends.

Repeat of pattern: 98 ends.

Filling: — 50 picks per inch, the same counts and arrangement of yarns as used in warp.

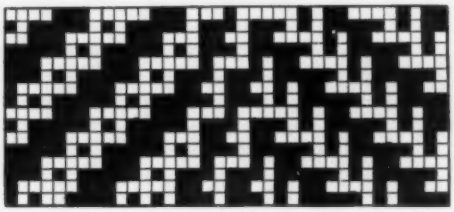
Finish: — Piece dyed worsted Melton finish, 56 inches finished width.

SERGESON'S SELF THREADING SHUTTLE.

The novelty of this shuttle consists in providing a threading arrangement, whereby the shuttle is more conveniently threaded and this without liability of the yarn returning into the shuttle after having been once drawn off the bobbin or cop. To accomplish this a specially shaped threading eye in connection with a suitable guide plate for the filling is provided, said threading eye and guide plate being so placed in the shuttle as to form a continuous passage way for the filling.

The details of the arrangement are best shown by means of the accompanying illus-

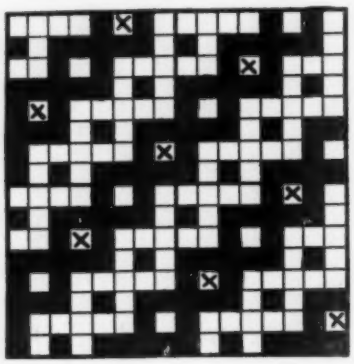
Worsted Melton Piece Dye.



Complete Weave. Repeat 36 × 8.

Warp: — 6,750 ends, all 2/48's worsted, in the gray.
Reed: — 16½ × 6 = 68 inches wide in loom.
Filling: — 88 picks per inch, 2\48's worsted, in the gray.
Finish: — Piece dyed, worsted Melton finish. 56 inches wide.

Worsted Cheviot Suiting.



Complete Weave. Repeat 16 × 16.

Warp: — 5,800 ends.
Reed: — 16 × 6 = 69 inches wide in loom.
Dress: —

2 ends, single 20's worsted cheviot, twisted with 2/80's cotton, white, mercerized ..... = 2 ends.
6 ends, 2/36's worsted cheviot, black ..... = 6 ends.
2 ends, single 20's worsted cheviot, twisted with 2/80's cotton, white, mercerized ..... = 2 ends.
34 ends, 2/36's worsted cheviot, black ..... = 34 ends.
2 ends, 2/48's worsted cheviot, black and blue ..... = 2 ends.
6 ends, 2/36's worsted cheviot, black ..... = 6 ends.
2 ends, 2/48's worsted cheviot, black and green ..... = 2 ends.
34 ends, 2/36's worsted cheviot, black ..... = 34 ends.

Repeat of pattern: 88 ends.

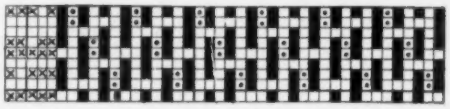
Filling: — 100 picks per inch, arranged thus: —

2 picks, 2/48's worsted cheviot, black and blue.
110 picks, single 20's worsted cheviot, black.

112 picks. Repeat of pattern.

Finish: — Worsted cheviot finish, 56 inches wide.

Worsted Trousering.



Complete Weave. Repeat 42 × 9.

Warp: — 7,672 ends.
Reed: — 19½ { 1 dent @ 5 ends; 5 dents @ 6 ends; 1 dent @ 7 ends } = 65 in. wide in loom.
Dress: —

5 ends, 2/64's worsted, black.
1 end, 2/64's worsted, black, twisted with 2/80's cotton, white.
1 end, 2/64's worsted, black and white twist.
16 ends, 2/64's worsted, black.
2 ends, 2/64's worsted, black and blue-green twist.
15 ends, 2/64's worsted, black.
1 end, 2/64's worsted, black and white twist.
1 end, 2/64's worsted, black, twisted with 2/80's cotton, white.

42 ends. Repeat of pattern.

Filling: — 86 picks per inch, arranged thus:

2 picks, 2/64's worsted, black.
1 pick, 3 run wool, black.

3 picks. Repeat of pattern.

Finish: — Worsted finish, scour well, shear clear, 56 inches wide.

Woolen Cheviot Suiting.

Complete Weave.
Repeat 6 × 6.

Warp: — 2,430 ends.
Reed: — 12½ × 3 = 65 inches wide in loom.
Dress: —

1 end, 3-ply 5½ run, woolen cheviot yarn, blue ..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive ..... = 2 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix .... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white.. }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white .. }
2 ends, single 2½ run, woolen cheviot yarn, olive ..... = 2 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive ..... = 2 ends.
1 end, 3-ply 5½ run, woolen cheviot yarn, brown..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive..... = 2 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix ... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white.. }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, gray mix }
2 ends, single 2½ run, woolen cheviot yarn, olive . } × 3 = 9 ends.
1 end, 2-ply 5½ run, woolen cheviot yarn, white.. }
2 ends, single 2½ run, woolen cheviot yarn, olive..... = 2 ends.
1 end, 2 ply 5½ run, woolen cheviot yarn, white..... = 1 end.
2 ends, single 2½ run, woolen cheviot yarn, olive..... = 2 ends.

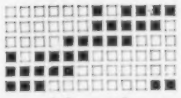
Repeat of pattern: 72 ends.

Filling: — 42 picks per inch, arranged thus: —

1 pick, 2-ply 5½ run, woolen yarn ..... = 1 pick.
2 picks, single 2½ run, woolen yarn ..... } × 31 = 93 picks.
1 pick, 2-ply 4½ run, woolen yarn ..... }
2 picks, single 2½ run, woolen yarn..... = 2 picks.

Finish: — Cheviot finish, scour well, clip on shear, 56 inches wide.

Worsted Suiting.



Complete Weave.
Repeat 12 × 6.

Warp: — 6,670 ends.

Reed: — 15 × 6 = 67 inches wide in loom.

Dress:—

2 ends, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 2 ends.
2 ends, 2/45's worsted, black and red-brown twist ..... = 2 ends.
2 ends, 2/32's worsted, green ..... = 2 ends.
6 ends, 2/32's worsted, black ..... = 6 ends.
2 ends, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 2 ends.
2 ends, 2/45's worsted, black and blue-green twist ..... = 2 ends.
8 ends, 2/32's worsted, black ..... = 8 ends.
2 ends, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 2 ends.
2 ends, 2/45's worsted, black and red-brown twist ..... = 2 ends.
2 ends, 2/32's worsted, violet ..... = 2 ends.
6 ends, 2/32's worsted, black ..... = 6 ends.
2 ends, 2/52's worsted, black, twisted with 2/So's cotton, slate
2 ends, 2/45's worsted, black and blue-green twist
8 ends, 2/32's worsted, black ..... } × 8 = 192 ends.
2 ends, 2/52's worsted, black, twisted with 2/So's cotton, slate .....
2 ends, 2/45's worsted, black and red-brown twist
8 ends, 2/32's worsted, black .....
2 ends, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 2 ends.
2 ends, 2/45's worsted, black and blue-green twist ..... = 2 ends.
8 ends, 2/32's worsted, black ..... = 8 ends.

Repeat of pattern: 240 ends.

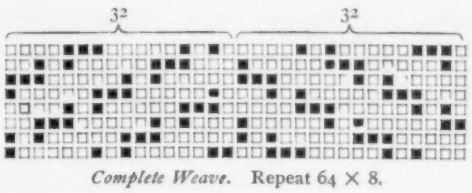
Filling: — 56 picks per inch, arranged thus: —

4 picks, 2/32's worsted, black ..... = 4 picks.
1 pick, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist ... = 1 pick.
1 pick, 2/32's worsted, green ..... = 1 pick.
3 picks, 2/32's worsted, black ..... = 3 picks.
1 pick, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist ... = 1 pick.
4 picks, 2/32's worsted, black ..... = 4 picks.
1 pick, 2/52's worsted, black, twisted with 2/So's cotton, slate ..... = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist ... = 1 pick.
1 pick, 2/32's worsted, violet ..... = 1 pick.
3 picks, 2/32's worsted, black ..... = 3 picks.
1 pick, 2/52's worsted, black, twisted with 2/So's cotton, white .....
1 pick, 2/45's worsted, black and blue-green twist ..... } × 19 = 114 picks.
4 picks, 2/32's worsted, black .....
1 pick, 2/52's worsted, black, twisted with 2/So's cotton, white ..... = 1 pick.
1 pick, 2/45's worsted, black and blue-green twist ... = 1 pick.

Repeat of pattern: 138 picks.

Finish: — Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Suiting.



Complete Weave. Repeat 64 × 8.

Warp: — 7,014 ends.

Reed: — 13 × 8 = 67½ inches wide in loom.

Dress: —

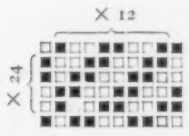
4 ends, 2/36's worsted, black ..... = 4
1 end, 2/64's worsted, black, twisted with 2/So's worsted, pearl ..... } × 2 = 4
1 end, 2/36's worsted, black and gray... } × 6 = 48 ends.
2ends, 2/52's worsted, black and red twist ..... = 2 ends.
2 ends, 2/36's worsted, black ..... = 2 ends.
1 end, 2/64's worsted, black, twisted with 2/So's worsted, pearl ..... } × 2 = 4
1 end, 2/36's worsted, black and gray... } × 5 = 40 ends.
4 ends, 2/36's worsted, black ..... = 4
1 end, 2/64's worsted, black, twisted with 2/So's worsted, pearl ..... } × 2 = 4 ends.
1 end, 2/36's worsted, black and gray .....
2 ends, 2/36's worsted, black .....
1 end, 2/64's worsted, black, twisted with 2/So's pearl ..... } × 12 = 48 ends.
1 end, 2/36's worsted, black and gray .....
2 ends, 2/52's worsted, black and blue ..... = 2 ends.
1 end, 2/64's worsted, black, twisted with 2/So's pearl ..... } × 11 = 44 ends.
1 end, 2/36's worsted, black and gray .....
2 ends, 2/36's worsted, black .....
1 end, 2/64's worsted, black, twisted with 2/So's pearl .. = 1 end.
1 end, 2/36's worsted, black and gray ..... = 1 end.

Repeat of pattern: 192 ends.

Filling: — 57 picks per inch, all plain worsted black.

Finish: — Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Melton Piece Dye.



Complete Weave.
Repeat 98 × 8.

Warp: — 3,570 ends.

Reed: — 15 { 15 dents @ 4 ends / 12 dents @ 3 ends } = 68 in. wide in loom.

Dress: —

25 ends, 2/18's worsted, in the gray ..... = 25 ends.
1 end, 2/40's worsted, in the gray
1 end, 2/10's worsted, in the gray } × 16 = 48 ends.
1 end, 2/40's worsted, in the gray
25 ends, 2/18's worsted, in the gray ..... = 25 ends.

Repeat of pattern: 98 ends.

Filling: — 50 picks per inch, the same counts and arrangement of yarns as used in warp.

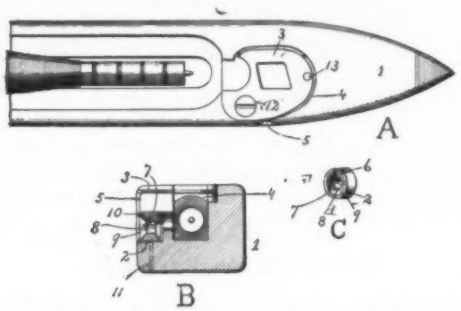
Finish: — Piece dyed worsted Melton finish, 56 inches finished width.

SERGESON'S SELF THREADING SHUTTLE.

The novelty of this shuttle consists in providing a threading arrangement, whereby the shuttle is more conveniently threaded and this without liability of the yarn returning into the shuttle after having been once drawn off the bobbin or cop. To accomplish this a specially shaped threading eye in connection with a suitable guide plate for the filling is provided, said threading eye and guide plate being so placed in the shuttle as to form a continuous passage way for the filling.

The details of the arrangement are best shown by means of the accompanying illus-

trations, of which Fig. A is a top view of that portion of a shuttle containing the threading mechanism, portion of the latter only being shown. Fig. B is a cross section of the shuttle through the centre of the threading arrangement, and Fig. C is an enlarged perspective view (as compared to Fig. B) of the threading eye.



Numerals of reference indicate the parts as follows: 1 indicates the body of the shuttle. Fitted into an opening in the side of said body 1 is the threading eye 2, and on the upper face of said body, above said eye, is the guide plate 3. In said body, below guide plate 3, is the channel 4, into which the filling thread is introduced after being run off from the bobbin or cop in the shuttle. In the side wall of the body 1, between said plate 3 and the upper side of the periphery of said eye 2, is the throat 5, which is in communication with the terminal of said channel 4.

In the upper wall of the eye 2, which is of substantial thickness, is the throat 6, which extends obliquely from the upper side of the periphery of said eye inwardly and is then deflected horizontally as at 7, to the central opening 8 of said eye, thus forming a communication between the throat 5 and said central opening, which in turn opens into the outside of the shuttle. The outer face of the eye 2 is countersunk, as at 9, leaving the flat rim 10 at the periphery. The eye is secured to the shuttle by means of the screw or pin 11. The guide plate 3 is secured to the shuttle by means of the screw 12 and the tension post 13, said post rising from the interior of the shuttle and being connected with the guide plate 3. The shuttle is threaded by having the filling pass from the bobbin or cop as the case may be, under the plate 3 and around the post 13, through the channel 4 until it reaches the throat 5, when it descends the latter and enters the throat 6, and traversing the latter is passed into the eye 2, and from there out of the shuttle. It will be noticed that should the portion of the filling outside of the eye run around said eye, the countersink 9, assisted by the obliquely extending throat 6, will keep said portion of filling at the periphery of the eye, especially on the rim 10, and so prevent it from re-entering the throat 6, and hence it cannot return through said throat, the throat 5, and the channel 4, to the bobbin or cop, but, on the contrary, retains its proper position in the eye 2 of the shuttle, so that the filling will be properly run off without liability of tangling with the bobbin.

UHLINGER'S IMPROVED WARP LET OFF FOR NARROW WEAR LOOMS.

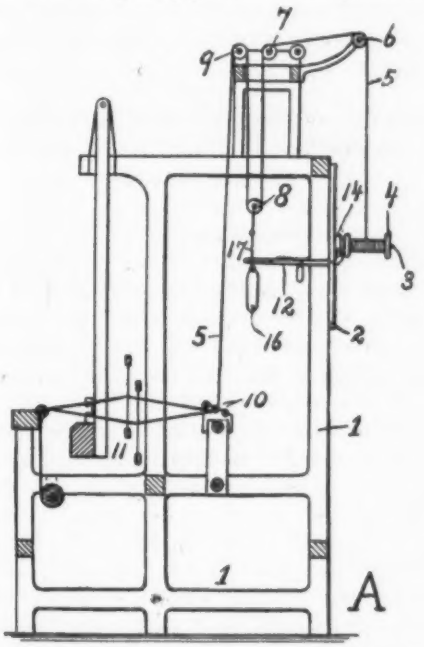
This motion is used in connection with ribbon or other narrow wear looms and belongs to that class of looms in which the delivery, i. e., let off of the warp thread from the spool is controlled by friction and operated by the take up of the thread.

The object of the mechanism is to provide a let off motion, simple in construction, and uniform and positive in its action, besides allowing exhausted spools to be easily substituted by full ones.

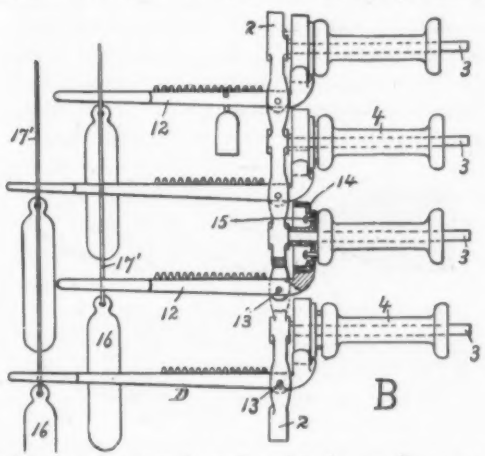
The working of the motion in connection with the loom and also the details of the arrangement are best explained by means of the accompanying illustrations, of which Fig. A is a vertical cross section, showing a portion of a ribbon loom with a single warp thread spool, supplied with the new let off. Fig. B is a side elevation, partly in section, and on a larger scale than in Fig. A, showing a series of spools and their let off mechanisms more in detail.

Referring to the illustrations, 1 indicates the frame of the loom, which is equipped with means for operating the lay, harness, and take up mechanisms in the usual manner. Two is one of a group of bars supported on the frame 1 and carrying a series of fixed rods 3, extending outwardly to receive a corresponding series of warp spools 4. The

warp threads 5 as coming from the spools 4 are passed up over the pulleys 6 and 7, then down under the suspended pulley 8 and back again over the pulley 9 from which point they



are passed under whip rolls 10 to the harnesses 11. Friction is put on the spools 4 by means of levers 12 centered at 13, pressing

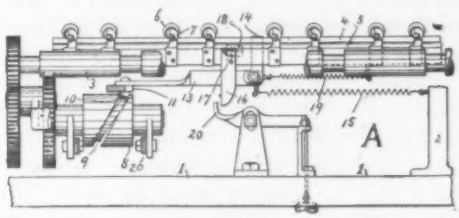


with its short end against friction pulleys 14, to which the spools are secured by means of screws 15, the other ends of said levers 12 being weighted in order to produce the required friction. The suspended pulley 8 is held down by a weight 16 which is connected to it by means of a wire 17 passing through the forked end of the lever 12. The friction on the spool 4 is sufficient to cause the pulley 8 and its weight 16 to rise when the take up motion of the loom is pulling the warp threads forward. As the weight 16 continues to rise, it finally comes in contact with the lever 12 and raises it slightly, which action causes a decrease in the friction on the spool 4 and consequently more warp is unwound. With this unwinding of the warp from the spool, the weight 16 falls out of contact with the lever 12 and thus the unwinding is stopped. The weight again starts upward and when it comes again in contact with the lever 12, the same unwinding will result, and in this manner a uniform and even let off of the warp is automatically obtained. The spools are not placed directly over each other in the frame, in order to avoid any interference with the freedom of the weights, also the levers 12 are made alternately long and short for the same purpose.

A NOVEL TRAVERSE MOTION FOR SPINNING FRAMES.

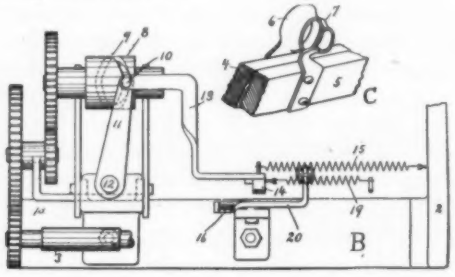
The object of this motion is to provide a traverse in connection with guide eyes on a spinning frame in order to prevent waste fibres and impurities from accumulating in the guide eyes and consequently tending to keep the roving from being strained or broken in its passage to the drawing rolls.

The new motion consists essentially in a traversing cam with lever connections to the traverse rod carrying specially shaped guide eyes, and in order to explain the mechanism



clearly, the accompanying illustrations are given, of which Fig. A is a front elevation of a portion of a spinning frame showing the principal parts of the motion; Fig. B is a top

view showing part of the mechanism, and Fig. C is a perspective view of a guide eye shown enlarged as compared to its views in the preceding illustrations.



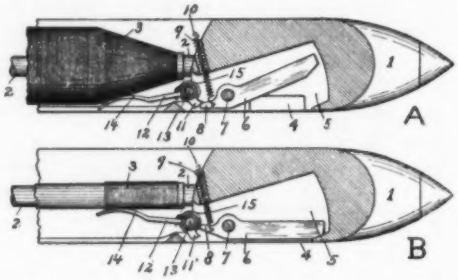
Referring to the illustrations, 1 indicates the beam of the spinning frame carrying the stands 2 which support the drawing rolls 3 (only one being shown) and the traverse rod or more correctly speaking two rods 4 and 5. The back rod 4 which is nearest the creel of the frame carries the guide eyes 6, while the front rod 5 carries the semicircular guide eyes 7. The traversing motion is given to the back rod by means of a cam 8 which is driven from the back roll 3 through the gears shown. Working in the groove 9 of the cam 8 is a pin 10 being carried in an arm 11 as pivoted at 12. Also connected to the pin 10 is a bent lever 13 which is connected at its other end to a projection 14 as attached to the back rod 4, and by this means the rod receives its backward and forward motion. A spring 15 is connected to the lever 13 and also to the stand 2, in order to take up any lost motion.

Attached to the front rod 5 is a projection 16, having a pin 17 which works in a slot 18 in the back rod 4. The lever 13 as attached to the back rod is also connected to the front rod through a spring 19. When the traverse rod 4 is moved to the left, the rod 5 is moved in unison with it until the projection 16 strikes against the trip lever 20 which stops it, while the other rod continues its movement. This movement separates the guide eyes 6 and 7, but they come again together when the right hand side of the slot 18 comes against the pin 17 and pushes the projection 16 over the trip lever 20, and the spring 19 acts to bring the rod 5 in its same relation with the rod 4, in which relation they remain during the backward traverse and until the projection comes again in contact with the trip lever 20. By the guide eyes leaving each other for a short space thus allows any waste fibres which have collected behind the guide to be carried forward and thus prevent any clogging of the eyes.

FILLING DETECTING MECHANISM FOR CROMPTON AND KNOWLES AUTOMATIC LOOMS.

The object of the mechanism is to provide a feeler device for the bobbin in the shuttle, so that a new bobbin or preferably a new shuttle containing a full bobbin may replace the bobbin, just before all of the filling runs entirely off, in order to prevent any possibility of missed picks in the cloth.

The mechanism consists essentially of a specially constructed shuttle and a projecting bar on the loom, for detecting the absence of filling on the bobbin at the proper time so that the replenishing mechanism may be operated to replace the exhausted bobbin with a full one. The details of the construction of the shuttle, showing the mechanism in the two principal positions, are given in the accompanying illustrations, of which Fig. A is a vertical cross section of the part concerned in the shuttle, showing the mechanism in the position when a full bobbin is in the shuttle, and Fig. B is the same cross section of the shuttle, showing the mechanism in the position which it occupies when the bobbin is nearly empty and ready to be replaced.



Referring to the illustrations, 1 indicates the body of one end of a shuttle, 2 a spindle for holding the bobbin or cop, pivotally mounted at one end in the shuttle, and 3 is the bottom portion of a cop as placed on the

spindle 2. A recess 4 is made in the outside of the shuttle near its rear end, and at the bottom of the shuttle. The recess 4 extends in the shuttle body upwardly in the form of a narrow slot 5, within which is free to move a latch 6, pivoted on a pin 7. The latch 6 in its raised position, as shown in Fig. A, leaves a free opening in the recess 4, but in its lowered position, as shown in Fig. B, closes the opening to the recess 4. The latch 6 has an extension 8 to which is attached one end of a coiled spring 9, the other end of said spring being attached to a pin 10, secured in the shuttle. The spring 9 acts to lower the latch 6 when it is released from engagement with the extension 11 on the filling feeler 12 which is pivoted on the pin 13. The curved flattened end 14 of the feeler 12 bears on the bobbin or cop 3 and is held in engagement with it by a spring 15 which is attached at one end to the feeler 12 and coiled around and fastened at its other end to the pivot pin 13 of the feeler 12.

When the bobbin or cop 3 is full, as shown in Fig. A, the feeler 12 is held outwardly, and the extension 11 is caused to engage the extension 8 on the latch 6 and hold the latch in its raised position against the action of the spring 9. As the filling on the cop 3 is gradually exhausted, the feeler 12, which is operated by the spring 15, moves on its pivotal support 13 until the filling is nearly exhausted, when then the extension 11 passes by the extension 8 on the latch 6 and allows the spring 9 to instantly lower the latch, as shown in Fig. B.

A projection from the loom, which enters the recess 4 in the shuttle when the lay comes up to the fell of the cloth, is suitably connected to the filling fork mechanism which operates the replenishing mechanism in the usual manner, and when the latch 6 is held up by a sufficiently large cop, as explained, the projection will enter the recess 4 properly and no transfer of bobbin, cop or shuttle as the case may be, will take place, but as soon as the cop or bobbin becomes small enough, through weaving, to allow the latch to fall over the recess 4, the projection is prevented from entering said recess 4, and consequently acts upon the filling fork which through proper mechanism replaces the cop, bobbin or shuttle as the case may be.

The time of the disengagement of the extension 11 on the feeler 12 from the extension 8 on the latch 6, to allow the latch 6 to be lowered, is regulated by the amount of filling to be left on the cop or bobbin 3 before it is replaced by a full one.

DRAG DEVICE FOR SPINDLES ON SPINNING FRAMES.

The object of the new device is to automatically put more drag on the spindle when the yarn is being wound on to the largest diameter of the bobbin and to gradually lessen this drag as the yarn is wound on a smaller diameter, in this manner preventing undue strain on the yarn when winding on a large diameter and allowing of greater speed of the bobbin when there is less strain on the yarn, in other words, the amount of drag is made proportional to the pull of the yarn.

The device consists principally in a felt roller which presses against the spindle, being supported in a frame to which is attached a graduated weight chain, the other end of the chain being attached to an arm which lowers and raises the chain in order to give more or less drag to the spindle.

The application of the device to the spindle and the details of parts are best shown by the accompanying illustrations, of which Fig. 1 is a view of part of a spinning frame showing

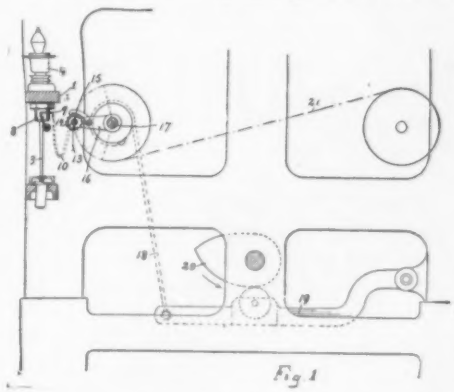


Fig 1

the parts of the device used in connection with a spindle, and Fig. 2 is a view of the chain and brake frame, shown extended.

Referring to the illustrations, 1 indicates the spindle rail, 2 the lifting rail, 3 the spindle and 4 the short tubular flier with cup shaped enlargement. The drag arrangement consists in a felt roller 5 supported in a light bent wire frame 6 having projections 7 for entering holes in the side of the bolster 8 for supporting the roller against the spindle 3. The arm 9 of the frame has attached the chain 10 consisting of graduated rollers 11 connected by links 12. This chain hangs down in a loop

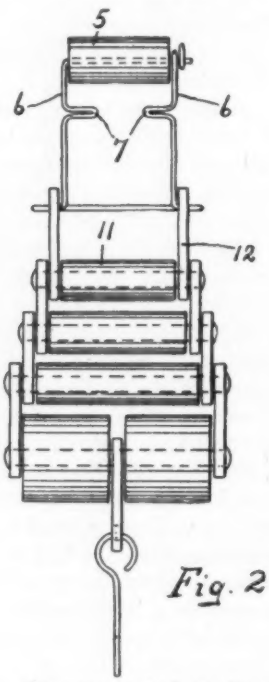


Fig. 2

and has a wire connected to its other end which is wound around the shaft 13, thus the lower down the shaft is, the more weight is put on the point 9 and consequently the roller 5 presses more on the spindle 6, and vice versa. The amount of weight can be regulated for different counts of yarn by the ratchet and pawl 14 and 15. By winding the chain on the shaft 13, less weight will act on the spindle 3. The shaft 13 is secured in an oscillating arm 16 centered at 17 and receiving its movement through a chain 18 and lever 19 from the cam 20, which is shaped so that when the yarn is winding on a large diameter, the arm 16 will be down and thus put more drag on the spindle, and vice versa. The connector 21 is used to give the same movement for the other side of the frame through similar arrangement of parts as that just explained.

AN IMPROVED LENO MOTION FOR CROMPTON AND KNOWLES DOBBY LOOMS.

In weaving leno on a power loom where production is an object, it is necessary that the whip threads should be given a half-and-return movement during the cross weaving; that is, a movement which will carry such warp threads from the top plane of an open shed, not down to the bottom of the shed, but only to an intermediate point and then back again to the original plane. At the same time when those threads are not used in cross weaving, they are carried by the harnesses, the same as in regular weaving from the top plane of the shed to its bottom. The mechanism for making a half-and-return movement of the required warp threads during the cross weaving, is operated in connection with the usual type of loom dobby, without interfering with the operation of the ordinary parts of the dobby to cause a full movement of the same warp threads when the cross weaving is not required.

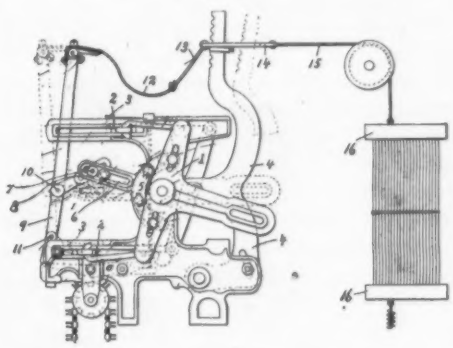
IN ORDER TO MAKE A HALF-AND-RETURN MOVEMENT

it is necessary to have the proper harness, which is to receive the motion, connected to a lever which will make two oscillations while the regular harness jack makes one, and for this reason a lever is provided which is connected to the harness to receive the movement, and is given a double oscillation to one oscillation of the harness jacks.

THE METHOD OF APPLYING THE MOTION TO A DOBBY

together with details of the motion, is best shown by means of the accompanying illustration, which is a side view of a dobby with the motion attached, showing the connection with the harness and also the positions the parts occupy when the harness jack is up, and the intermediate position in dotted lines or during the half-and-return movement.

The rocker arm 1 gives the backward and forward motion to the lifters 2 for operating the hooks 3, which are connected, through levers shown, to the harness jacks 4 in the ordinary manner. On one side of the rocker arm 1 is secured an adjustable arm 5 which carries a slot 6 for holding a pin 7 as secured in the lever 8. This lever 8 is attached to the lever 9 at the joint 10, the lever 9 being fulcrumed at 11 and having attached at its other end a strap 12 which is connected through a wire 13 to a slotted link 14. This link 14 passes over the top end of the harness jack 4, and is connected at its other end to the strap 15 as attached to the loom harness 16.



In the position shown in full lines, the harness jack 4 is holding the loom harness 16 up and the strap 12 is then not acting on the harness, owing to the inward position of the lever 9 at that time. When the jack now moves to the right to lower the harness, the lever 9 moves to the left and consequently tightens the strap 12 so that the harness is held in an intermediate position for an instant.

IF THE PATTERN CALLS FOR THE HARNESS TO BE UP

for the next pick, the harness jack will catch the link 16, just as the strap 12 is being loosened by lever 9, and thus we get the half-and-return movement.

IF THE HARNESS IS TO BE DOWN

on the next pick, the lever 9 will hold it in the intermediate position for an instant, and then move back allowing the harness to fall the rest of the distance.

NOTES ON DRAWING.

The process of drawing which follows carding or combing when the latter process is used, appears so simple in its operation to anyone giving it only a casual examination, that important considerations of the process are sometimes neglected.

The slivers from the finisher card or comber as the case may be, are fed up behind the drawing frame from the sliver can, as placed conveniently behind the drawing frame, there being usually six or eight slivers fed up together for operation by a delivery of drawing; there being generally six deliveries in a machine. The improvement in the material under operation as it passes from the breaker card to the time that it gets to the last process of drawing, is very noticeable. The sliver from the first process of drawing as it appears in bulk is fairly even and the fibres parallel, and considering that it has to be doubled and passed through two more processes of drawing, it will be further evened up and the fibres brought into better parallel order.

In order to understand how the sliver becomes gradually more uniform, it is necessary to explain the principles of draft and doubling of slivers in a drawing frame.

DRAFT

when applied to one sliver passing through a machine only makes the delivered sliver more uneven per yard, and if this increasing unevenness could not be overcome, the process would be more hurtful to the final yarn than beneficial. But this condition is overcome by means of doubling slivers at the rear of the drawing frame, that is, placing several ends of sliver of the same average weight together at the feed end of a machine so that they will be delivered at the front end of the machine as one end. From the nature of the preparatory machines which deal with the cotton before it reaches the drawing process, it is easy to see that the sliver fed to the drawing frame will have thick and thin places in its length. This being so, if we combine several slivers so that they enter the machine together and are acted upon as one sliver, the thin and thick places in the different slivers

are more or less counterbalanced by the other slivers combined with it, so that when these combined ends are subjected to a draft the resulting single sliver will be delivered more even than if only one end was passed through alone.

It might be argued that a less uniform sliver will be produced, provided several thin or thick places come in the slivers together in the machine, which is entirely reasonable with the conditions named, but as a matter of fact in actual practice, the first mentioned conditions are so much in the majority that the resulting sliver is necessarily more uniform than a sliver fed to the machine. This principle of doubling is followed all through the spinning of cotton so that the total number of doublings from the picker to the spinning frame sometimes reaches to the hundred thousand mark.

The slivers, after being doubled and fed to the machine, are now subjected to a draft by the drawing rolls in the frame. If a single sliver were put up at the back of a drawing frame and subjected to a draft of say 6, the sliver, when delivered, would be one-sixth as heavy per yard as compared with what it weighed when it was fed, in other words, one yard of the sliver fed would produce six yards of delivered sliver. Now let us suppose that we doubled six slivers at the back of the machine and that the total draft of the machine was 6, then the result would be that the sliver being delivered would measure six yards for one yard fed of the combined slivers at the back and also that this delivered sliver would weigh one-sixth per yard of the combined sliver or equal to the weight per yard of a single sliver fed up at the back of the machine.

Provided the draft does not correspond to the number of doublings at the back of the machine, we may derive the following rule for ascertaining the weight per yard of the delivered sliver, with the weight per yard of the slivers fed and the draft in the machine given:—Multiply the weight per yard of a single sliver fed by the number of doublings and divide this product by the total draft. In regard to the number of doublings to make in the entire process of drawing, it is advisable to use as many as possible in order to produce an even sliver, but due consideration must be given to the cost of the operation which will limit the number of doublings. With a large number of doublings, more attention to the frame is necessary and consequently more help is needed.

A good rule for very short stapled cotton and low counts is to have two processes of drawing, for medium counts three processes, and for fine counts and long staple cotton as many as four processes.

In the medium counts where three processes are used and which is the most frequent number, we should have $6 \times 6 \times 6 = 216$ doublings in the drawing frames.

With the operation of doubling slivers in a drawing frame a condition is brought into the machine which requires a consideration. Owing to the lack of strength in the slivers, it very often happens that a sliver will break, and in case there was no mechanism for detecting this break, the frame would continue running for some time before the attention of the attendant was directed to it. Then a very great amount of waste would be made, because the whole length of delivered sliver would have to be taken out, which had been running with five ends instead of six; or if the end was pieced up and allowed to run on with the light sliver at the front, the yarn made from that length would be one-sixth lighter or finer than the remainder of the yarn.

When a sliver is made with one sliver absent in the doubling, said delivery sliver is then known as "single," and in order to prevent single from being produced, an arrangement is provided on the drawing frame for automatically detecting the absence of sliver and in turn stopping the machine when a break occurs. This motion is called the back stop motion as it has to be distinguished from other stop motions on the machine in different parts of the frame. Single may be also prevented to a great extent, by constant attention on the part of the one attending to the machine in connection with the stop motion.

(To be continued.)

In 1763 Rouen, France, was the principal market for the sale of raw cotton.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

FINISHING WOOL AND MIXED FABRICS.

XXXI.

BY N. REISER.

(Copyright, 1904, by The Lord & Nagle Co.)

Figs. 116, 117, 118 show three different apparatus for weighting cloth. At Fig. 116 the

FIG. 116.

FIG. 117.

cloth only passes into the liquor and is then squeezed twice by the upper rolls as shown. The apparatus shown at Fig. 117 is similar to that at Fig. 116, but the cloth is squeezed but once. At Fig. 118 the lower squeeze roll is immersed in the liquor.

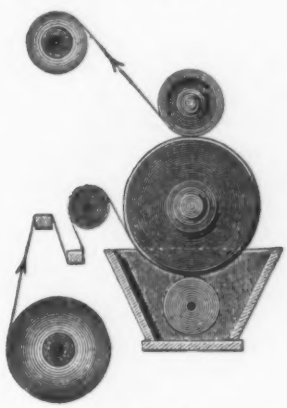


FIG. 118.

SOFTENING HARD BOARDY FABRICS.

Goods handle hard and boardy from various causes:

1. When made of hard, stiff material such as cheviot wool, mixtures of wool and cotton or other vegetable fibres. Mixed goods are very likely to handle boardy after having been well fulled.

2. Imperfect treatment when scouring the wool. The use of a too strong alkali solution, having the liquor too hot, leaving the material in the liquor too long, drying at too high a temperature or too long.

3. Wool is often made harsh in carbonizing by a too strong acid solution, leaving the material too long in the drying room, or by using too strong an alkaline solution for neutralizing the acid.

4. Using too strong a mordant or boiling too long when dyeing.

5. Twisting the yarn too hard when spinning.

6. Too close a set of the fabric and weaving it too tight.

7. Having the goods too dry during the fulling process.

8. Pressing too hard or at too high a temperature, also by decatizing too severely.

9. Weighting the goods too heavily with starch or other sizing materials.

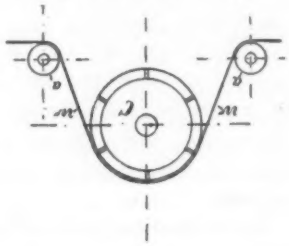


FIG. 119.

The following remedies are recommended for softening goods that have become hard and boardy:

1. The cloth is rinsed in fuller's earth. This should be employed only in the case of gray goods or those dyed with fast colors. It should not be used for wool dyed goods if the colors are bright.

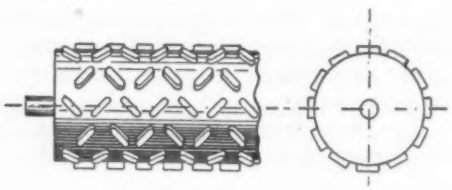


FIG. 121.

2. Good results are obtained by rinsing the cloth in a solution of acetic acid, which, as is well known, brightens the colors.

3. Boiling the cloth in water. The pieces should be unwound immediately after boiling, and cooled.

4. The goods are run for fifteen or twenty minutes in a rotary fulling mill with the crimping boxes heavily weighted; then the cloth is saturated with a dilute solution of soap. The goods are softened more quickly by running very dry, but there is danger in such cases of causing streaks and wrinkles which cannot be removed. Good results are also obtained by running the pieces in hammer stocks.

5. Gigging the back softens all classes of goods.

6. Good results are obtained by running the pieces on the smoothing machine, which is an ordinary gig with metal projections in place of the teasels.

Special softening machines have been built for goods made of vegetable fibres and silk as

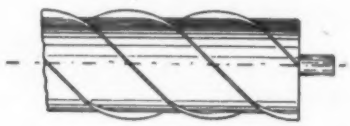


FIG. 120.

well as for half wool goods. Figs. 119, 120, 121 and 122 show the working parts of several forms of these machines. Fig. 119 is a spiral cylinder, and a cross section of the same cylinder is shown at Fig. 120. This cylinder is similar to the spiral cylinder of a cloth shear, but has a less number of spirals, and these are blunt instead of being sharp as on the shear cylinder. The two rolls, a a, are for the purpose of holding the cloth on the spiral cylinder. The force with which the cylinder works on the cloth depends upon the tension with which the cloth is held.

Fig. 121 shows another kind of cylinder. Metal blocks as shown in the illustration are attached to the surface of the roll. The cloth

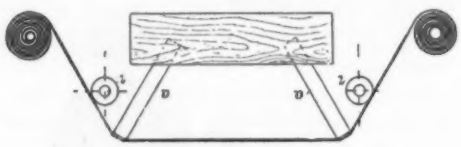


FIG. 122.

is passed over this revolving roll under tension and in this way the knobs or raised parts of the roll soften the fabric. Another form of this machine is shown at Fig. 122. The cloth passes over the metal or wooden bars, a a, the edges with which the cloth comes in contact being covered with brass. Pressure on the cloth on these edges is regulated by the adjustable rolls, r r. The best means of soften-

ing goods which have been made too hard with size or other weighting material, is to rinse the pieces in lukewarm water.

WATERPROOFING.

There are practically an unlimited number of methods employed for waterproofing cloth, but I will confine myself to giving only a few of them.

1. 4 1/2 lbs. of pulverized alum, 4 lbs. of potash water glass, 6 1/2 lbs. of white vaseline are mixed with 26 gallons of water. When the ingredients are thoroughly dissolved the goods are passed through the solution.

2. 15 lbs. of alum and 12 lbs. of white lead are mixed with 26 gallons of water. This solution is allowed to stand until the liquor is clear. The clear liquor is then drawn and the goods to be waterproofed are passed through it. The pieces are next treated in a soap solution and rinsed in clear water and dried. After drying the goods are coated with a rubber solution.

3. 5 1/2 lbs. of glue and the same quantity of neutral tallow soap are mixed with 26 gallons of boiling water. 16 lbs. of powdered alum is then slowly added and the mixture boiled for fifteen minutes. When the solution has cooled to 120 deg. F., the goods are passed through it and then rinsed and dried.

Fabrics can be treated so that they will float in water. The process for this purpose was patented in 1893, and the inventor claimed that a person dressed in cloth thus treated could float in the water from 36 to 40 hours. I leave the responsibility for this claim to the inventor, but the following is a brief description of the process:

1. Glue, tallow and alum are dissolved in water at a temperature of 194 deg. F. in the following proportions: 1 lb. of glue, 1 lb. of tallow, 1 lb. of alum in 2 1/2 gallons of water. The cloth is saturated in this boiling solution and when dried is impervious to cold water.

2. A solution is made of the following ingredients:

Spermaceti 40 parts, paraffine 30 parts, resin 50 parts, colophomium 50 parts, India rubber 30 parts, gutta percha 20 parts, oil of rosemary 10 parts, sulphur 1,000 parts, ether 1,700 parts.

The cloth is saturated in this solution and then transferred quickly to cold water in which it is left for about 36 hours.

ROWY GOODS.

When cloth is made of contrasting colors, particularly when the color of the warp is in sharp contrast with that of the filling, streaks especially filling ways, are likely to appear. This imperfection may be removed partially by coloring the streaks with charcoal, chalk, pencil or water colors. The water color is applied with a pencil, sponge, or piece of cloth. The work is done on a perch or with the cloth on a slanting table.

The operator first selects the color as nearly as possible to that of the cloth and then applies it carefully to the streaky places so as to make the shade uniform in the piece. After the first application the pieces are brushed with a large brush or a piece of cloth wound in a small roll. Much skill and good judgment are required for this work.

SPECKING.

Black ink is generally used in specking goods. There are many different ways of making this ink. Following are a few recipes that have been thoroughly tested in practice:

1. 4½ lbs. of logwood, 4½ lbs. of alcohol, 2¼ lbs. of ground gall nuts are dissolved in 1½ gallons of boiling water and left to stand for eight days in a tightly corked flask. The solution is then filtered through closely woven linen cloth. 4 ozs. ammonia, 4 ozs. indigo, and 18 ozs. copperas are mixed with from 6 to 8 pints of water and boiled for one-half hour. These solutions are then mixed and stored in tightly corked flasks. The ink should be well shaken before using.

2. ¾ oz. logwood, 1¼ oz. gall nuts, ¾ oz. copperas, ⅜ oz. sour wine, and 1¼ oz. lampblack, are boiled in 1½ gallons of water. The ingredients are placed in a linen sack and weighted to make them sink in boiling water. This mixture is boiled for four or five hours until the quantity is reduced to 3 quarts. It is then filtered through a linen cloth and is ready for use. It should be kept in tightly corked bottles.

(To be continued.)

THE STRUCTURE OF COTTON DUCK.

BY TURICUM.

(Cont'nued from September.)

II.

Warp Calculation: How many yards in 5.4 ounces No. 12 cotton yarn?

There are 52.5 yards of No. 1 yarn in one ounce; of No. 12 yarn, twelve. Then:

$$52.5 \times 12 \times 5.4 = 3402 \text{ yards}$$

of No. 12 yarn in warp. A fair allowance for shrinkage warp-ways is 27.5 %. Any differences could be made up in using a different number of picks. Therefore to make 100 yards of cloth we need 127.5 yards of warp. We consequently have to divide 3402 yards by 127.5. Multiplying by 100 gives the number of ends in the width.

$3402 \div 127.5 = 26.68 \times 100 = 2668$ ends in the width. Divide this by the width of the cloth, $2668 \div 22 = 121$, and the result is the number of threads in one inch.

It has been said that 7/8 of the number of threads that will lie side by side in one inch are required to make a hard, solid duck. We must have 121 single threads in one inch to get the correct weight.

The question now is, what ply of yarn we have to use to make this proportion. We know 24 threads of No. 1 yarn lie side by side in one inch, 7/8 of this number would be 21. These 21 now multiplied with the square root of the single yarn gives the total number of threads in one inch divided by the ply. We have 121 threads. The square root of 12 is 3.464. Multiplied by 21 gives 73 threads per inch of No. 12 single, but we need 121 in one inch to make the weight. We will try two ply. This equals No. 6 single in weight. $\sqrt[2]{6} = 2.449$. $2.449 \times 21 = 51$ threads of 12/2 ply would be the right amount. We need $120 \div 2 = 60$ threads. This is not close enough yet and we must try three ply. $121 \div 3 = 40\frac{1}{3}$ threads. 12/3 equals No. 4 single in weight. $\sqrt[2]{4} = 2 \times 21 = 42$ threads of 12/3 ply are the result. This is as close as we can get to the weight, and this number of threads will have to be used. We are now using $1\frac{2}{3}$ twisted threads too many in the warp, but such slight variations will always occur in the calculations, and can be made up in the picks.

Hard duck contracts very little in the width after the warp leaves the reed, and for light goods, one inch on 22 inches is ample allowance. No. 6 duck and up is generally considered light, and from No. 5 down, heavy duck. The number of ends in the width are $42 \times 22 = 924$ divided by width in reed gives us the number of ends per inch in reed, $924 \div 23 = 40.17$ threads. With three ends in a dent we need a $40.17 \div 3 = 13.39$ dent reed. This finishes the warp calculation.

Filling Calculation: We need 3.6 ounces of No. 12 yarn. $52.5 \times 12 \times 3.6 = 2268$ yards of filling. This divided by the inches in the reed will give the number of threads per inch to make the correct weight. $2268 \div 23 = 99$ threads. We can put into the cloth 3/4 of the amount that will lie side by side. No. 1 yarn is the standard, with 24 threads; 3/4 of this is 18. Therefore we multiply this number 18 by the square root of the single number which equals the twisted yarn in weight, and the one that comes nearest shall be used. 99 threads are needed. $\sqrt[2]{12} = 3.464$. $3.464 \times 18 = 62$. This is 37 threads short. Two ply must be tried. $12 \div 2 = 6$ single yarn. 99 threads of single 12 are about the same as 49 of 12/2. $\sqrt[2]{6} = 2.449 \times 18 = 44$ picks. This would also be too light, and we must go on to three ply. $99 \div 3 = 33$ picks are needed of 12/3 to make required weight. $\sqrt[2]{4} = 2 \times 18 = 36$ picks. This ply of yarn is the nearest, and should be used. We consequently put in 33 picks of 12/3 ply filling.

Having explained the method on one kind of duck, we might briefly go over to another and make the same calculations.

Problem: Make a No. 4 or 15-ounce duck from No. 7 yarn. What ply warp and filling, and how many warp threads and picks must be used?

15 ounces, weight of cloth
9 ounces, weight of warp being 60 %
6 ounces, weight of filling being 40 %

Warp: 9 ounces No. 7 yarn. $52.5 \times 7 \times 9 = 3307$ yards divided by $127\frac{1}{2}$ % = 2594

ends in width. $2594 \div 22 = 118$ threads in one inch. After several attempts to get the ply of yarn, we settle on 7/4 ply for warp, this being the nearest. $7 \div 4 = 1.75$ single yarn. $\sqrt[2]{1.75} = 1.322 \times 21 = 28$ threads per inch in the warp. $118 \div 4 = 29$ threads to make correct weight. Slight differences will creep in but with a little experience one ought to be able to judge what is best to use. The reed calculation is $28 \times 22 = 616$ divided by $23 = 27$ threads. With two in a dent we need a 13½ dent reed.

Filling: 6 ounces No. 7 yarn. $52.5 \times 7 \times 6 = 2205$ yards of filling divided by $23 = 96$ threads to the inch. After several trials, 7/4 ply is found to be the nearest to what will make the duck. $7 \div 4 = 1.75$ single. $\sqrt[2]{1.75} = 1.322$ multiplied by 18 makes approximately 24 picks to the inch. $96 \div 4 = 24$ picks are needed to make the correct weight.

It is deemed advisable when starting to make duck by the foregoing formula, to first figure out how much it will weigh. This calculation is but a check on the first. In heavy duck, the warp, if figured out with only 27½ % mileage will be found to be light. The increased shrinkage, however, in this grade of goods will make up for the difference, and the surest way is to have a small sample woven after the formula and weighed. If found to be too light, put in as many additional picks as needed. The calculation in this case is very easy when one fully understands the foregoing instructions.

Very often it is necessary to have the cloth break at a certain strength. Failing to do so, more threads are inserted. This again brings the weight up. The warp may be stronger than needed, while the filling falls short. A few ends of one are then taken out and added to the other system. Where this is impossible, a finer number of yarn must be used, with an increase in the ply, as it is a well-known fact that the strength of a finer yarn is not in proportion to its size.

Sometimes it happens that an order is accompanied by a sample to be duplicated. Often it is not larger than a postage stamp, and good judgment is required to make the goods acceptable to the customer. Heavy losses may be entailed if a mistake is made. Generally the procedure is as follows: Ascertain carefully how many threads per inch are in warp and filling; cut the sample to a given size and figure out what its weight would be with the given width; see what ply yarn, both warp and filling, is used; pull out several warp threads, and by applying a reasonable tension measure the length. From this it is easy to get at the per cent of mileage. Do the same with the filling. This is essential, and great care must be taken as the reed calculation is derived therefrom. Test the twist in both systems, in the ply as well as single yarns. Ravel out the warp threads and weigh them separately; after this weigh the filling. Knowing what per cent each of the cloth weight is, warp and filling, you can figure out by the foregoing rules what number of yarn has been used. Never try to compare one unknown yarn with another of known count; trials from one yarn to the other in weaving are too expensive. A hard twisted yarn will look finer than a soft one of the same count.

These calculations will be of great benefit to weavers in other branches of manufacture, as others can figure out their own standards. They will not give always the exact results anticipated, but from the results obtained in each particular case one will get practical experience, and long practice linked with a good, sound theory will overcome any difficulty.

Raw Stock Dyeing Machine. Colell & Beutner, Neukirchen, Saxony, have recently brought out an improved machine for coloring raw stock. The dye liquor is forced through the stock by a rotary pump and the machine is therefore based on the well-known circulating principle. Many different forms of the circulating machine are now in use in France and Germany and new types are constantly appearing. While differing very little from each other in general principles great improvements have been made in the construction and general arrangement of the different parts to save time, labor and dyestuffs.

WOOL PICKING AND CARDING.

BY SAM DRIVER.

BLENDING AND OILING BATCHES.

Carders as well as superintendents have a tendency to overlook the importance and value in this department of having their batches blended and oiled as they should be. Too much emphasis cannot be laid on the importance of having the batches properly blended and oiled to make good carding and spinning. Carders should watch with great interest this part of the operation for their own benefit, as well as for the company's.

FINE WOOL.

No. 1 blend: 500 lbs. all wool Saxony, Australian or No. 1 Ohio fleece, spun 10 run. We will first run it through the wool duster and then through the bur picker. Lay down in five layers. To each layer spread on 8 qts. of oil (olive oil would be best). Beat down each layer with a pole. When through blending, run through the picker twice, feeding light and mixing well in gauze room. It is now ready to sheet up. Let it lie four days in the sheets before going to the cards. When ready for the cards run through picker once. Eight quarts of oil to 100 lbs. No water.

COARSE WOOL.

No. 2 blend: 500 lbs. of coarse wool run through duster and bur picker and laid down in five layers. To each layer spread on 4 qts. of oil and 10 qts. of water. Pole each layer. Run through picker twice. Four quarts of oil, 10 qts. of water to 100 lbs.

No. 3 blend: Oxford mix; 500 lbs. batch wool and shoddy. 125 lbs. black wool, 125 lbs. white pulled wool, 250 lbs. black shoddy.

Fifteen quarts of oil, 20 qts. water. This is allowing 6 qts. of oil to 100 lbs. of wool and 8 qts. of water to 100 lbs. of wool; nothing for shoddy. If desirable, more oil and water can be added. Mix black and white wool together and run through wool duster and bur picker. Run the shoddy through mixing picker. Make five layers of wool and five layers of shoddy. First layer of wool put on 3 qts. of oil and 4 qts. of water. Beat well with pole. Then put on layer of shoddy; beat with pole. Next, a layer of wool and then a layer of shoddy alternately until finished. In feeding, take top to bottom of pile. Feed on light and run through the picker three times, mixing well every time.

You will notice that I do not put any oil or water on the shoddy, but put it on the wool. I will give my reasons for doing so: First. The shoddy has already received enough oil during the process of manufacturing. Second. It will not fill and gum the cylinder and doffer wire with flocks and fine dust. Third. The cards will run longer without stripping. Fourth. It makes more even, smoother and stronger yarn, and it cards and spins better.

The same rule for the blending and oiling of this batch can be applied to any percentage of wool and shoddy. To those using emulsions, the same percentage of oil and water can be used and batches laid down the same way, but keep the emulsions from getting on the shoddy and cotton as much as possible.

HOW TO SET A MIXING PICKER WITH CONCAVE FEED ROLLS. MOTTO: SAVE THE STAPLE.

1. The picker should be set on a solid foundation so that there will be no vibration.

2. The spiked feed roll and concave dish should be set as close as possible to the cylinder teeth and not strike. This will keep the feed roll from winding stock.

3. The feed roll should be set down in concave within half an inch of striking. If set way off, the stock will dwell in concave and cause it to cut the staple. Motto: Save the staple.

4. The feed rolls and apron should run as fast as the cylinder will take it. This saves the staple, because there will be no chance for the stock to dwell in the concave.

5. The grates and outlet kept clean and not allowed to get filled up with dirt under the picker. This will give a better draft and the picker will do better work. The stock will be cleaner.

6. Plenty of ventilation back of the gauze room, and the belts all good and tight.

MIXING PICKER WITH SPUR TEETH FEED ROLLS.

The feed rolls must be set as close to the cylinder as on concave feed; everything else the same.

THE FEARNAUGHT WOOL MIXING PICKER.

The Fearnaught is a machine consisting of workers, strippers and doffers covered with steel spur teeth and built after the style of a woolen card. It is far superior to any other class of mixing picker for opening and mixing stock.

The workers should not be set too close to the cylinder. In setting the workers and strippers good judgment must be used and great care taken not to set them too close to the cylinder or they may cut the staple. Sometimes it may be necessary to take out one or even more workers on some qualities of stock, so as not to break the staple. They can be adjusted on and off the cylinder about the same as a woolen card. Have the belts good and tight, the grates kept clean, and the bearing well oiled and the Fearnaught will run through a large amount of well picked stock in ten hours.

To get a very large amount through, one man should be taking it out of the gauze room as fast as it runs it. Feed on light and regular, if fed by hand. Automatic feeds are best and save once picking, particularly on all kinds of colored mixtures. I will say again, every carder should have full charge of the picker room. The boss picker should be under his charge. It is not wise to have it any other way.

CARDING FINE MIXTURES.

To card mixes free from specks, the wool should be in the very best possible condition or it will be absolutely impossible to take out all the specks. Specky goods are a source of trouble, also a costly trouble in the manufacture of mixed goods. The cards must be in faultless condition from the first breaker to finisher. They must be smooth and sharp and kept so.

All the workers in the set should be put as close to the cylinder as possible and not strike. Set the workers to the strippers with the eyesight, ear, or with a very fine gauge. Set off the strippers all through the set with 24 gauge; set the doffers on the first and second breakers with 28 gauge; set the fancy by gauge as explained in the other chapters; keep the stripper belts tight and clear.

Be careful not to let the cards run too long without stripping, and when they are stripped have half the strippers stripped at the same time; never have all the strippers cleaned at one time except when going on another color.

Many carders look upon the strippers or a set of cards as being of no account only to take the wool from the workers and place it on the cylinders, but let me tell you right here and with a good deal of emphasis that the strippers have a much more important part to perform than just to take the wool off the workers and place it on the cylinder.

Good results can be obtained by lifting and lowering the strippers to cylinder on different qualities of stock. If the workers are in good order the strippers do a good deal towards straightening out the fibres. They also have a good deal to do in placing different qualities of stock on the cylinder; if set close they set the stock on the cylinder closer than if set loose; if set loose the card will card the stock more than if set tight. For anything except mixes they should be set tight, except on finishers.

Carders should study the workings of the strippers or a set of cards more; it would be to their interest and it would also surprise them by the benefit they would derive. In reading these articles take particular note of what is said about the strippers.

Wire Basket for Hydro Extractors. Edmund Kuchenmeister, Freiberg, Germany, has recently placed on the market a wire basket for hydro extractors for which marked advantages are claimed over the perforated metal baskets. In the new basket there are forty-two upright bars held by an upper and a lower ring. The wire is wound around the frame and is also braided in the opposite direction from the upper to the lower ring. The advantages claimed are a larger space for the egress of the liquor, and greater security against explosion. The builder claims that the same surface speed with the wire basket will extract the water from textile materials much more rapidly. The new basket has been subjected to prolonged tests at a surface speed of 233 feet per second in German mills with very satisfactory results.

MEMOIRS OF A VETERAN MASTER MECHANIC.

BY EBEN GOULD.

(Continued from January.)

Up to this time, the fulling soap was used by carrying the soap from the soap tanks to the fulling mills in pails. The cloths were run into the mills dry and when ready the mill would be started and the soap poured on from the pails while the mill was running. I thought this was a poor way, as the men would be careless and not get the soap evenly on the cloth, so that some parts of the cloth would be dry, while other parts would be quite wet. This made lots of trouble, as the soapy parts would commence fulling before the dry parts, and when done many of the pieces would vary in width.

Another trouble caused by this method was in carrying the soap about the room in pails. A lot of it would be dropped on the floor when the men were dipping the pails into the soap, and they would not stop to wipe off what had adhered to the outside, but start for their mills.

I saw that this annoyed Mr. Twitcher very much. Up to this time I had never seen a soaping machine nor indeed had heard of one, but I thought of a way in which the goods could be soaped without covering the floor all over with soap. One day while Mr. Twitcher was scolding about there being so much soap on the floor, I said to him:—

"What makes you have the soap carried to the mills, when the soaping can be done so much easier and without waste of time, and the mills could do more than one-third more work in a day."

"What do you mean?"

"I can make a machine and set it by the soap tanks, that will soap your goods even, put on as much or as little as you want, and pile the pieces up all ready for the fuller; and when they are put in the mills they will commence to full as soon as the mill starts, instead of waiting until the soap has been put on. The goods will full more evenly, and there will be no narrow or wide places in the pieces."

"Go ahead and make your soaper," he said.

I had no conveniences for making an iron frame, so I made one of wood with two large rolls about 28 inches in diameter, one at the bottom and one at the top, with an iron roll of about 4 inches diameter between. These rolls were long enough so that the cloth could be stretched out the whole width, so as to enter the rolls in only one thickness. On the floor in front of the machine was a box with a 6-inch roll near the bottom; the cloth passed down under this roll into the box, which was full of soap, then up over the bottom roll, under the 4-inch iron roll, then back over the iron roll, under the top roll, then around the top of the roll, then off to a folder roll, then down on to a truck ready for the fulling mill.

The soaper worked all right, and during Mr. Twitcher's time not a single piece of goods was soaped by any other machine. It took less soap, and, as I expected, the mills did one-third more work than by the old way. The same man that had formerly made the soap now did all the soaping; the quantity of soap required could be regulated by two 1/2 inch screws that could be turned down on to some heavy rubber springs, that rested on the caps of the top rolls.

Some years later, I saw a soaping machine, in which the cloth was handled somewhat after the style of the rotary fulling mill, but I do not think it soaped the cloth as evenly or as quickly as my old rollers that did not have to stop to change pieces, all the stops that were made being when there were no more pieces to soap.

From this time on to the July of 1864 everything went on nicely, the mills making army goods all the time. After the first rush there was not so much running nights. It seems that the contract for making the soldiers' cloth provided that none of the waste falling from the wool was to be used over in making these goods; the wool selected was of a pretty coarse grade and quite a large amount fell under the cards and elsewhere and was counted as waste, but it proved to be a fact that a good part of this so-called waste was the finest and best part of the wool. This was stored away until the contract for soldiers' cloth was completed, and then the mill owners went to making what was called officers'

cloth, a dark blue cloth made wholly from the waste from the stock of which the soldiers' cloth was made.

It was a fine nice cloth and as soon as it was on the market the government bought it quick enough, paying a much higher price for it than had been paid for the soldiers' cloth made from the coarse part of the same wool. That was the first time I ever heard of any one paying more for goods made of refuse stock than for goods made from new wool.

At that time the mill was called the Madderkirk Mills; they were then sold and the name changed to the Handelsmann Woolen Mills, starting under that name August 1, 1864, James Dewso was agent. Mr. Dewso was for many years agent of a mill at Woonsocket, R. I., where he commenced work as a finisher about 1841. He came from the town of Northbridge, where he worked as boss finisher for Mr. Sylvanus Holbrook. I first knew Mr. Dewso there when I was a small boy. His wife used to do the drawing in of the warps and one of my first jobs was to hand in for her, so that when he came to Dedham we were old time acquaintances.

For some unaccountable reason, the old help that for a long time had worked under Mr. Twitcher, refused to stay and work for the new company under Mr. Dewso. All the overseers except myself left in a short time, and I was urged to do the same, having several jobs offered me to go to other places, but remembering the many annoyances I had to contend with during the six years and six months of my time with them I concluded it would be better to stay with Mr. Dewso, whom I had known all my life, and for whom my father had worked for thirty years. I soon found that I had a far more pleasant situation than I had with Mr. Twitcher, and the old help, and yet I had made many friends.

The old Brown engine had been running many years and some of its parts were somewhat worn. It was overloaded, and steam had to be carried pretty high in order to keep up the required speed. There were some changes wanted in the machinery and there was some question as to whether the engine would be able to take on any more load.

Mr. Dewso came to me and asked if I would object to a man coming from the Corliss Machine Works to look over the engine and see if it was all right and whether it could be made to do more work. I told him there was nothing that would suit me better than to have it done. The next day instead of writing, he sent me to the Corliss works in Providence to see Mr. Corliss, and tell him just what was wanted. I went there and saw them and they sent a Mr. Clark, one of their oldest and best engine men, down. Mr. Dewso told him what was wanted; he was to look at every part and see if it was not possible to get more power.

At night we commenced taking off the valve bonnets, looked at the set of all the valves and gave the machine a most thorough looking over. We then replaced every part exactly as it was found. When all was ready to start Mr. Clark said:

"Can you show me the machinery that this engine is driving?"

"Yes," I replied, "we will go to the top room first and look in each room as we come down."

We came down from the spinning room through the carding, weaving and finishing room; then I said:

"We will go down into the fulling room."

"You are not going to show me any more, are you?" asked Mr. Clark.

"Yes," I replied, "you have not seen the heaviest of the machinery yet; the fulling and washing is all down in the next room below."

He went down and looked through the last room and he said:

"Is this engine driving all that work?"

"There is nothing else to drive it."

It was then time for the help to come in and start work. Mr. Clark stayed and looked around at the machinery working until Mr. Dewso came, and then went to the office and told Mr. Dewso, that he had looked over his engine, replaced every part as he found it, and that he could not find anything in the least out of place. He said:

"There is only one reason why the engine will not run easier."

"What is that?" asked Mr. Dewso.

"It has too large a load to drive. The set of the valves cannot be better, the engine is

all in good shape and order, but the present load is more than one-third larger than it ought to drive."

From that time I had my own way in managing the engine and boilers, as well as in doing the general repairs of the mill.

During all of Mr. Twitcher's time, the repair shop had been in a building that stood on the mill dam at the upper mill or dyehouse about one-third of a mile up stream from the main building or the brick mill as it was generally called. During the first year of Mr. Dewso's time, it was moved down into the basement of No. 1 building at the brick mills.

I seldom went down to the mill unless sent for by some one of the overseers, unless it was to go to the engine and boiler room. About one week after Mr. Dewso became agent, I was sent for by the boss finisher, Bob Specker, to come to the mill. I hurried down and found that the belt that drove the brushing machine had slipped from the pulleys and been carried around the brush. The belt then caught around the driving shaft overhead and wound up carrying that end of the machine to the top of the room, and when the machine hit the shaft the belt broke and down came the machine with a crash to the floor. This machine was the only one at the mill at that time, and it was kept in pretty constant use. It was an old style machine with wooden frame with two brush cylinders about 22 inches in diameter. The principal damage was the breaking of one of the spiders of one cylinder. Mr. Specker said:

"I would like the machine fixed, so as to get the cloth brushed, as I cannot case up the usual amount of goods unless I can get them brushed."

I had no new spiders, so I filled a wooden hood inside the legs of the cylinder, then fastened it to the spider and to the legs of the cylinder. I worked through the noon hour, and ten minutes after starting time the brush was at work.

I then went down where Mr. Specker was at work and told him that his brush was working and I guessed I would go for my dinner, and was about to start away when I saw Mr. Dewso coming down the room looking as if he was very much annoyed.

I waited by Mr. Specker until Mr. Dewso came where we were. He then called me by name and said:

"Gould, what are your men at the shop doing?"

"They were all at work when I left," I said, "and each one had work enough to keep him busy longer than until this time."

"Well," he said, "I went into the shop as I came down and saw only one old man at work."

He spoke very sharp and as if he was vexed about something. I held my temper which was fast going up to the boiling point, and said quietly:

"I will go and see what they are about."

Then I walked away. Had it been a stranger that had come to fill the place as agent I should not have felt so cut up as I was to have one that I had known all my life speak to me in the way he did.

I found the men all at work, and then went for my dinner. In about an hour after I came from dinner Mr. Dewso came into the shop and said:

"Gould, how often do you go down to the mill?"

"I go to the mill when I am sent for, sometimes once in three weeks, sometimes once a week and sometimes two or three times a day just as I am wanted."

"Well," he said, "hereafter, I want you to go down two or three times every day, whether you are sent for or not."

"No, Mr. Dewso," I said, "I do not want to go where I am not wanted, and I do not want to go where a man that does not know why I am there may come growling at me like a dog with a sore head, and I will not put myself in the way of being growled at again."

He said:

"I want it to be your business to go to the mills at least two or three times each day, and I assure you that no one will ever find any fault with you; you will never hear another word from me."

Then he asked:

"Have any parties been trying to hire you to go to other places?"

"Ever since it was known that you were coming to this mill, I have had a number of places offered to me, and not until today have I had any idea of going to any of them, but

now I think as you and I cannot get along with mutual confidence that I had better go."

Mr. Dewso was at that time boarding at the Phoenix House in Totschinken. It seems that day that some parties told him a mess of stuff in regard to me. That was the cause of his annoyance and of his speaking as he did. He then told me that after I went away from the mill Mr. Specker had said to him:

"Mr. Dewso, I think you have made a mistake in speaking in the way you did." Then Mr. Specker told him about the accident to the brush machine and that I had worked through the noon hour to get it going, and that he, Mr. Specker, thought I ought to be commended rather than spoken to in that way. He thought it was rather poor thanks for a man who had always been willing to work nights and noon times to keep the machinery going.

Mr. Dewso told Specker what the man at the hotel had told him. Mr. Specker then told him that it was one of the parties that were trying to hire me to go to another place.

At this time Mr. Specker was on his notice to leave, and he knew I was wanted at the same mill where he was going. He also told Mr. Dewso that before he came I did and said all that I could to get the old help to stay, and many of them did stay.

Mr. Specker was an honorable man. He would have liked to have me go to the mill where he was going, but he would not see any one wronged if it was in his power to prevent it. Mr. Dewso told me all that he said, and I assure you it lowered my temperature, which had been at boiling point all that afternoon. The idea of going had gone, and I told Mr. Dewso that I would stay, and would go to the mill as often as he desired. He kept his word, and I never heard an unpleasant word from him after that, and he was one of the most pleasant men I ever worked with.

I have always held a grateful remembrance of Mr.Dewso. Most men in his place would have kept still and let the disagreeableness go on, but he would not see a wrong done that he could prevent. He passed away many years ago, a kind, good man whom I shall never forget.

ENGLISH NOTES.

(From our Special Correspondent.)

The next winter season in dress goods promises to be good in translucent fabrics. Merchants have already made ready to meet the demand, not only in voile and grenadine cloths, but also in the white and colored foundations that are sold with and for them. The mercerized sateen will form a large item in the foundation cloths and there is lively competition among its manufacturers.

Voile plain and unadorned looks unprepossessing enough in the piece. It is of single yarn of a hard quality of worsted, usually dyed black and woven 48 ends and 40 picks to the inch, or 44 and 36, thus leaving an appreciable amount of daylight between the threads. To relieve its sombre appearance the Germans are introducing voile ornamented with embroidered spots of artificial silk. The tambouring is hand-tied at the back and is done at an extra charge of 13 1/2 cents over plain cloth. The ornament may be in any color, in white or in black upon the black background, and a favorite figure is the diamond, either single or double. Worsted is used for the voile because cotton crumples in wear and drapes less gracefully. Artificial silk lends a smooth metallic lustre that natural silk does not possess.

The voile and the grenadine, combined with a mohair and mercerized cotton crepon, figure in a large number of so-called grenadine cloths. Most of these are cotton both ways, save for the warping of mohair. The width and distances apart of the ladder-like unwarped stripes are varied to taste, the tendency being to minimize the size and frequency of the latter. The newer race of Bradford manufacturers have proved fertile in inventing new combinations that are more to the domestic taste possibly than those that come from the Continent. Many mills are profitably busy over these rather intricate fancies, while those engaged in classic plain goods are idle or running looms at no profit. Mohair is preferred to silk, not only by the makers, but by consumers generally.

The silk grenadines from Continental sources would be flimsy affairs indeed were it not for their stout stripes of cotton. The one

shown at Fig. 1 is more suggestive of veiling than of dress material, yet the cords of six ends of strong cotton flanked on each side by six more woven plain of finer cotton make the fabric reasonably firm. The filling is of thrown single silk and more in the nature of an organzin than an ordinary tram. A more firmly bound and laced grenadine is made, containing very much more cotton. The warp floats show short bars of luster yarn.

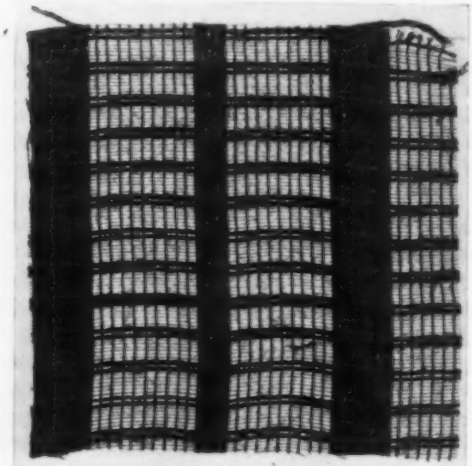


Fig 1

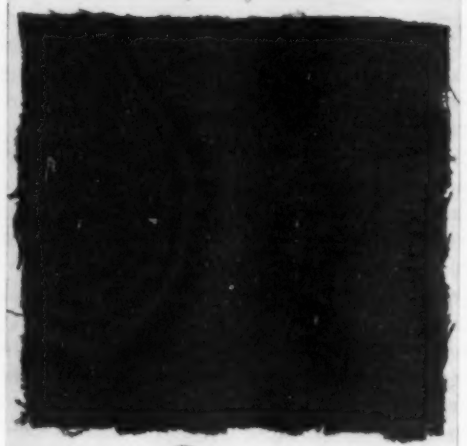


Fig 2

A novelty that may fairly claim to be called remarkable is the production of a clever Bradford manufacturer, Fig. 2. It is neither voile nor grenadine nor a common crepon. It combines the richness of astrakhan with some of the characteristics of a matelasse and its reception is secure. The mohair is bound by threads of cotton which are shrunk in the mercerizing bath so that the figure stands out in bold relief. No doubt the same means will lend itself to other designs than the one here shown. The problem to solve is the production of such cloths at the popular price of 56 cents per yard.

The cotton trade has got back to something near its normal hours of work. Virtually all the spindles were running the first week of November and it is anticipated that within a few weeks more the idle looms will all be in full operation. The market for cloth shows more inquiry, although purchasing is not liberal. It is believed that the undoubted depletion of stocks everywhere will lead to a general demand.

Rather extravagant ideas are harbored in some quarters as to the future of British grown cotton. Recent events have inspired great enthusiasm for cotton supplies outside of America. Workpeople as well as employers are subscribing to the funds of the British Cotton Growing Association. A dramatic effect was imparted by the action of some Lancashire operatives who gave up the pay of their first full day of work to the Association. Their employers contributed a like amount.

One incident of note is the final break-up of the Miller loom. A recent auction disposed of the effects of the company. This appliance created a sensation on its appearance some years ago. Its action was one of knitting rather than weaving, and its fatal defect was its inability to make firm fabrics.

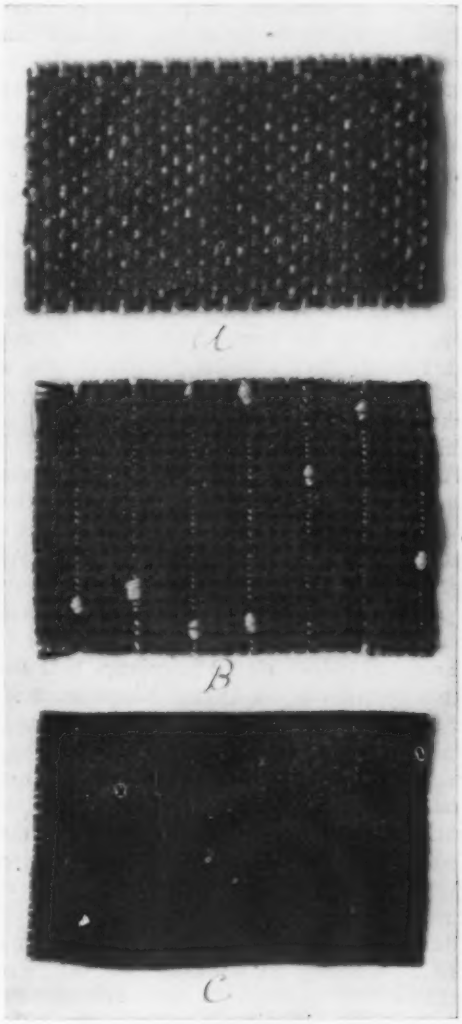
Echoes of bad trade and the impossibility of regaining the advance on wool come to hand from several points on the Continent. In the generally depressed state of trade here it is the more noteworthy that Canadian labor agents are enlisting emigrants for mills in the Dominion. Women agents are attracting female weavers in considerable numbers, even advancing passage money to secure help. Our merchants are still enthusiastic over Canada and one is reported to have booked through direct to Vancouver with

seventeen cases of patterns; which is "going West" with a vengeance.

Attention is being drawn to New Zealand's tweeds. Besides manufacturing for the island's domestic requirements there is some considerable export toward the Australian continent. South Africa promises to be left alone among Britain's colonies as a non-textile land for a single small woolen mill in Natal is disproportionate to the demand. The imports into Cape Colony, it may be estimated, will be a round two million sterling by the end of the year, including the following lines; haberdashery and millinery, cottons, wearing apparel and hats. Woolens may touch three-quarters of a million. The South African market is fast becoming a necessity to our traders, whereas it was formerly a luxury that could be spared.

It may be due to our effete nature that no Grosvenor has thus far arisen in England. There are pure-beer cranks and various sorts of fiscal cranks, but no wool-crank is yet in sight in legislative circles. For this state of things no apology is necessary, and manufacturers are busy mixing sugar with the sand without a thought of Parliament. Doubtless if it were to come to a measure of strength the cogent arguments of our woolen manufacturers would undo anything that the comparatively small coterie of domestic wool-growers could say. In Australia there is some ill-feeling among flock-masters concerning the ways of West Riding, but even there farmers know on which side their bread is buttered, and the world at large is not a safe place for the unguarded fanatics to wander loose who seek to restrict the use of the by-products of wool.

Pattern A makes a striking example of the way in which woolen manufacturers are increasing the material wealth of the world. Its style may be open to some improvement and alteration, but the skill with which the ingredients are mixed approaches finality. The heavy white warp is angola that burns freely when tested with a light. The still heavier filling gives all the impression of all-wool with a greater strength than carded-wool is apt to yield. There is no cotton to be detected until the thread is unwrapped, when it immediately appears that a black core thread of cotton lends invisible support to the woolen. When the cotton is withdrawn the woolen residue is tender and unserviceable as compared with the excellent resisting power of the original thread. The wool being



loosely spun covers well and weaves quickly because the picks are few. The cloth "walks" down the loom and on to the beam and is therefore cheap. The Colne Valley manufacturers will make money on these goods at 30 cents per 18-ounce yard 54 in. wide.

The cloth B is one more example of the art of making something from next to noth-

ing. It is a dress fabric that is sold at 13 cents per yard, 38 inches wide, and in which woolen material is a non-essential unless its cheapness commends its use. The warp is cotton dressed 4 ends colored to 2 black, with a black or white line with a silk slub at short intervals. The filling is of soft low-grade cotton or angola woven in twos of black and color, producing a sort of basket weave of wide and flimsy texture. In the end a fabric is obtained which appears to possess far more than its real value and appeals to those of frugal mind.

In pure worsted in self-colors the pattern C shows a showy and simple dress-weave. The warp is two-fold, the filling single and with two ends and two picks a basket effect is obtained that shows a rather hard and lustrous yarn to the best advantage. A clean, smart finish does the rest. Such cloths, of Bradford origin, are offered at 25 cents 42 inches wide, and they have done well with the public.

A quantity of cottony knit goods from America have been retailed in England. They must have been sold, our makers assert, at a loss. From an advice shown me from Egypt I gather that a similar condition rules there. In all, some $75,000 worth were imported from America in 1903.

From an official return it appears that the cotton factories of the United Kingdom number 2,476, with about 44 million spinning and 4 million of doubling spindles and with 683,620 power looms. That these are not enough, in the opinion of some persons, is clear. New mills aggregating 1 3/4 million spindles are projected. It is in fine counts, chiefly Sea Island and Egyptian that the extensions are proposed. The Bolton district mills already include 5 million active spinning spindles, working for the most part on these qualities.

The town of Cambria, France, was long famous for its manufacture of fine linen goods. One of the fabrics of pure linen threads was called cambric, out of compliment to the city. It is said that it was so fine "that the greatest thread was not so big as the smallest hair that is."

TEXTILE CALCULATIONS.

BY ARTHUR DYSON.

I have no intention of giving here all the problems which a cotton mill man may be required to meet in the course of his career, but to answer a few questions which often come before superintendents, overseers and employees, and to give some rules that may be of use to the readers of the Textile World Record. Perhaps some of them may be familiar, and possibly have been published before, but if so, my excuse will be that a large number of your readers are unfamiliar with them and will be pleased to get hold of the information they contain.

Question: How to find the change gear required to give 68 picks in cloth being woven on a Whitin loom. Ans.: Circumference of sand roll, multiplied by number of picks, divided by number of teeth in ratchet wheel, multiplied by teeth in shell gear and teeth in stud gear, and divided by sand roll gear.

Ex. Sand roll 14¼ in. diameter, picks 68, ratchet 100 teeth, stud 17 teeth, shell 21 teeth.

$$\frac{14\frac{1}{4} \times 68 \times 17 \times 21}{100 \times 100} = 34.59 \text{ or } 34, \text{ change gear.}$$

To find the stud gear proceed as follows: —

$$\frac{100 \times 100 \times 34}{14.25 \times 68 \times 21} = 16.7 \text{ or } 17, \text{ gear.}$$

Question: What is the quickest way to find the average number in a piece of cloth when the sley, pick, width and yards per pound are known?

Add together the sley and picks, multiply by the width and then by the weight, divide by 840 (less allowance for take-up and size).

Ex. Sley 80, picks 80, width 40 inches, 6 yards per pound. Find average number.

$$\frac{(80 + 80) \times 40 \times 6.00 \text{ yds.}}{780} = 49.3, \text{ average number.}$$

To find the filling required for the above cloth it is customary to decide on the warp yarn, say 40's, and then proceed as follows: —

Add sley and picks and divide by average number. From this subtract the result of the sley divided by the warp count, and the remainder will be the proportionate part of the

filling. Picks divided by the proportionate part of the filling will give the filling count.

Ex.
$$\frac{80+80}{49\cdot3}=3\cdot25$$
$$80\div40=2$$
$$3\cdot25-2=1\cdot25$$
$$\frac{80}{1\cdot25}=64\text{'s filling.}$$

Another way to find filling required to govern yards per pound is as follows: —

Sley multiplied by the width, multiplied by 100 yards and divided by yards per hank multiplied by number of yarn, less per cent. for size and shrinkage.

If more than one beam is used the different number of ends on each beam are divided by the proper divisor and the results added together.

Divide 100 yards by yards per pound; result is pounds in 100 yards. Take from this result the weight of the warp, and the remainder is the weight of the filling; multiply by 840, and divide the product of the picks and the width in reed by this result; the quotient is the number of the filling.

$$\frac{80\text{ (sley)}\times40\text{ (width)}\times100}{31{,}200\text{ (yds. per lb.)}}=10\cdot26\text{ lbs. warp}$$
$$\frac{100}{6}=16\cdot67\text{ lbs.}$$
$$16\cdot67-10\cdot26=6\cdot41\text{ lbs. filling.}$$
$$\frac{80\text{ (picks)}\times43\text{ (loom width)}\times100}{6\cdot41\times840}=64\text{'s filling.}$$

To find yards per pound from the warp and filling we proceed as follows: —

$$\frac{80\text{ (sley)}\times40\text{ (width)}\times100}{31{,}200}=10\cdot26\text{ lbs. warp}$$
$$\frac{80\text{ (picks)}\times43\text{ (width in loom)}}{64\text{ (filling)}\times840}=6\cdot40\text{ lbs. filling}$$
$$\frac{100\text{ (yds.)}}{10\cdot26+6\cdot40}=6\text{ lbs. per yd.}$$

An easy way to find the average number from the above is to multiply the weight of the warp by the yards per pound; the result is the per cent. of warp. Do the same with the filling, then multiply each count of yarn by its per cent. and add products together; the result divided by 100 is the average number.

$10\cdot26$ (lbs. warp) $\times 6 = 61\cdot56$ per cent. of warp
$6\cdot40$ (lbs. warp) $\times 6 = 38\cdot40$ per cent. filling

$$61\cdot56\times40=2462\cdot40$$
$$38\cdot40\times64=2457\cdot60$$
$$4920\cdot00$$
$$\frac{4920}{100}=49\cdot2\text{, average number.}$$

Ex. What is a quick way to find the average number in a small piece of cloth, say 3 inches square (9 square inches), counting 80×80; and the yards per pound?

Multiply sley by 9 and picks by 9, add products and then add 8 per cent. more for shrinkage and size. Result is total inches of yarn, which must be reduced to yards. Divide 840 by number of yards. Weigh the sample and divide 7000 by the weight in grains. Divide the latter by the former and the result is the average number.

80 (sley) $\times 9 =$ 720 inches
80 (picks) $\times 9 =$ 720 inches
1440 inches
8 per cent. 115·2
1555·2 inches

$$\frac{1555\cdot2\text{ (inches)}}{36\text{ (in. per yd.)}}=432\text{ yards}$$
$$\frac{840}{432}=1\cdot944$$
$$\frac{7000}{7\cdot3\text{ (grains)}}=959$$
$$\frac{959}{1\cdot944}=49\cdot3\text{, average number.}$$

To find yards per pound for the same piece of cloth, multiply 7000 by square inches of cloth and divide by the product of the weight in grains by the width and inches per yard.

$$\frac{7000\times3\times3}{7\cdot3\times36\times40}=6\text{, yards per pound.}$$

How to find the number of ends required to weave a piece of cloth 32 inches wide to average 104 sley on a dimity pattern.

Multiply average sley required by dents per pattern, and divide the result by the ends in pattern. Result is reed required. Reed multiplied by width of cloth gives dents in reed to be used. Deduct 12 dents for selvage, divide remainder by dents per pattern and the result is the number of patterns.

Multiply number of patterns by ends in each beam per pattern, and result is number of ends required, except that on the bottom beam 48 ends must be added to the selvage. Add all

the ends, divide the sum by the width of the cloth and result will be the average sley.

To find the width this will take in the reed, find the actual dents per inch in reed and divide into the dents being used.

Ex.

Dents	Ends B B	Ends T B
4	8	·
1	·	3
1	2	·
1	·	3
7	10	6

$\frac{104 \times 7}{16} = 45$ reed.

$45 \times 32 = 1440$

$\frac{1440 - 12}{7} = 204$ patterns

$204 \times 6 = 1224$

$204 \times 10 = 2040$

Selvage 48

3312

$\frac{3312}{32} = 104$, sley.

On this class of goods 2½ inches would be enough to allow for shrinkage at the reed, and the rest of the process is as follows: —

$$\frac{45 \times 32}{34 \cdot 5} = 41 \cdot 74, \text{ dents per inch,}$$

or, take reed required, deduct 1 dent; 95 per cent. of the remainder will be the actual dents per inch. Divide dents used by dents per inch and result is width in reed.

45 (reed) — 1 = 44

95 per cent. 41·80 = dents per inch.

$$\frac{1440 \text{ (dents)}}{41 \cdot 8 \text{ (dents per inch)}} = 34 \cdot 45, \text{ inches in reed.}$$

The reason for deducting the 1 dent per inch and finding 95 per cent. of the remainder is that the shrinkage is changeable, and the higher the sley the greater the shrinkage. On this account no fixed number of dents can be dropped, but by getting a percentage of the sley we allow for a greater shrinkage in high sleys than in low ones.

How to determine what amount of warp and filling there is in a piece of cloth, what will be the amount used by a certain number of looms, and total amount required to make an order of, say, 1000 pieces of 50 yards each.

First find the percentage of each yarn according to rules already given, then find the yards per week the looms will weave. Divide yards per week by yards per pound, the result is pounds per week. Multiply by the looms run, the result is pounds per week woven. By the per cent. of warp and filling we get the proportion of this total in warp or filling, and this divided by the number of pieces woven per week will give pounds of warp or filling per piece. Multiplying by number of pieces to make gives pounds required.

Or, yards per piece divided by yards per pound equals pounds per piece. This, multiplied by per cent. of warp, will give pounds of warp in piece and remainder is pounds of filling. Number of pieces woven per week multiplied by pounds of warp per piece gives warp yarn used per week. Pounds of warp per piece multiplied by pieces to be woven gives pounds of yarn required.

Ex. 6 yards per pound, 50 yards per cut, 1000 pieces to weave.

$\frac{50}{6} = 8 \cdot 33$ lbs. per cut.

$61\frac{56}{100}$ per cent. = 5·13 lbs. warp per cut.

$38\frac{44}{100}$ per cent. = 3·20 lbs. filling per cut.

5·13 × 300 (cuts per week) = 1539 lbs. warp per week.

3·20 × 300 (cuts per week) = 960 lbs. filling per week.

5·13 × 1000 (cuts in order) = 5130 lbs. warp for order.

3·20 × 1000 (cuts in order) = 3200 lbs. filling for order.

A quick way to find sley reed required for a piece of fancy cloth is: —

Determine number of dents in pattern, divide by width of the pattern in hundredths and the quotient is the reed.

Ex. 9 dents per pattern and $\frac{30}{100}$ in width of pattern.

$$\frac{9}{\cdot 3} = 30, \text{ reed.}$$

If the count of the cloth is known multiply the actual reed by the hundredths in the pattern, and the result is dents per pattern.

30 × ·30 = 9 dents per pattern.

Real tapestry cannot be made by either weaving or embroidery, but in a manner unites the two processes. One square yard of tapestry of the finer sort is considered a fair year's work and is valued from $800 to $2,000.

INVISIBLE WASTE IN COTTON MANUFACTURE.

The final result of stock taking in a keenly managed and well-operated mill is very unsatisfactory so far as balancing the finished product with the raw material is concerned. The opinions of different mill men on what should be the percentage of unaccountable waste are as varied as the different conditions under which they work. There must be a loss as the avenues for it are found in every process, including the indifference of some operatives, who, without appreciating the value of cop or warp waste, will throw it away, and then it will find its way down the river or under the boiler. The waste question keeps the superintendent constantly reminded that "life is not an idle dream."

The superintendent and the manager depend on the loyalty of the overseer, and in the course of a few months the waste account will prove itself. The writer once knew of a superintendent who had pressed his overseer very hard concerning his waste account, stating as a last resort that the overseer must either show a change in his figures or there would be a more serious charge for him. The result was that the figures changed, but the waste was made for weeks and was never weighed or even found its way to the waste house. Such proceedings are rare and should never occur.

Mill management or oversight is not what it was before manufacturing became a science. I have had many a superintendent tell me it is a constant struggle. Each mill man has his own idea regarding keeping account of the income and output of his plant. I will endeavor to bring out what seem to be the most simple and practical methods of keeping account of production, and also of loss, which, if not suppressed, will increase and choke the entire plant like weeds in a garden. One method of watching the waste in a weave room that is quite frequently used is given below. It is simple and at a glance the superintendent is kept in touch with the running of the weave room, and while it is not complicated serves as a guide for both manager and overseer.

WEAVING Dep't WEEK ENDING 190

STYLE	LOOMS	REMARKS	FILLING NUMBER	WARP NUMBER	LOOMS WAITING
TOTAL					

	LBS	%
Cop WASTE ...		
Dirty Cop		
WARP		
Slasher		
Sweeps		
TOTAL ...		

TOTAL LBS WOVEN .....
NUMER OF CUTS .....
SECONDS MADE .....

..... OVERSEER

E. R. WILLIS.

Merino sheep were bred originally in Spain and were so called from the fact that the pastures were under the care of a merino, or inspector. At present they are the property of the Crown.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Test of Cloth Extractor.

Editor Textile World Record:

How much water should be left in woolen goods by a centrifugal extractor? Dry Gig (371).

The amount of water in extracted cloth depends upon the fabric and efficiency of the centrifugal extractor. If the fabric is close and solid it will not absorb moisture as well as will a soft, spongy and loosely woven cloth. The efficiency of a cloth extractor is tested by weighing the pieces as they come from the machine and again after drying. The pieces should not be subjected to any process of finishing between extracting and drying. For example, a piece of kersey weighs 81 1/2 pounds when extracted and 62 pounds when dry, showing that the extractor left in the piece 19 1/2 pounds of water which was removed by drying. This 19-1/2 pounds is 31 4/10 per cent. of the dry weight of the piece. By making an occasional test of this kind the efficiency of the machine can be determined. The tests should, of course, be made with the same fabric as the amount of water retained by different fabrics varies widely.

Following are the results of tests of an extractor on six pieces of tightly woven kerseys, style 4608, and two pieces of loosely woven beavers, styles 1441 and 1382. The water left by the extractor in the kerseys varied from 25 7/10 to 37 7/10, while that left in the beavers varied from 80 1/10 to 85 7/10 respectively:

STYLE	WEIGHT			Percentage of water based on dry weight
	Extracted	Dry	Water	
4608.....	81½	62	19½	31·4
4608.....	63½	50½	13	25·7
4608.....	65½	51½	14	27·1
4608.....	73	53	20	37·7
4608.....	73	56	17	30·3
4608.....	75½	55	20½	37·3
1441.....	104½	56	48	85·7
1382.....	104¼	58	46½	80·1

The wide variation here disclosed was probably due to the fact that the pieces were run in the extractor for the same length of time irrespective of the fabric, and shows the necessity of gauging the time of running by the class of goods handled. The speed of the extractor is of course limited by considerations of safety.

Analysis of Cloth.

Editor Textile World Record:

Enclosed is a sample of cloth made by —— Mills. How can I learn the layout of this fabric and the size of the yarn? We are making goods like this sample and are very anxious to know how the goods are made. Anxious Seat (397).

The best way for a manufacturer to determine the structure of a competing fabric is by analysis. With a knowledge of how to analyze cloth and make the necessary calculations, a man with good judgment and a general knowledge of manufacturing in the particular line of goods analyzed can determine very closely the layout, size of yarn and kind of material. It is necessary, however, to first learn how to do this important work. He can then duplicate any sample submitted to him for which his machinery and general mill facilities are adapted. Every overseer, designer and manufacturer should make a thorough study of the analysis of fabrics.

The practice of analyzing fabrics will broaden one's knowledge of manufacturing and overseers in every department will find it a valuable means of fitting themselves for higher positions. It often enables one to determine the cause of faults in fabrics and the difference between the goods and the original sample. To analyze cloth properly it is necessary to know how to determine the existing structure of any given fabric and how to make the necessary calculations. Good judgment and a knowledge of manufacturing is also necessary in order to estimate closely the changes that have taken place in any particular fabric since it was woven.

Sal Ammoniac and Sal Soda.

Editor Textile World Record:

What is the chemical difference between sal ammoniac and sal soda? David (390).

Sal ammoniac is the name given to chloride of ammonia, a product obtained by treating gas wash liquors with muriatic (hydrochloric) acid until neutral to test papers, when after evaporation, the crystals that separate are crude muriate of ammonia. These crystals contain tarry impurities which are eliminated by subliming the crude crystals in closed iron pans, when a tough fibrous cake forms on the under side of the cover. This hard mass is known commercially as sal ammoniac.

Whether in a fibrous form or as crystals, it is chloride of ammonia N H_4 Cl.

Sal soda is an entirely different substance, being crystallized sodium carbonate, represented by the chemical symbols Na_2 CO_3 + 10 H_2 O, and is approximately half the strength of soda ash, which is simply Na_2 CO_3 containing traces of impurities. Sal soda is made on a very large scale by dissolving soda ash in warm water, allowing it to settle. The clear solution is then drawn off and allowed to deposit the crystals, which contain 60 per cent. of water.

Neither of these salts can be used as a substitute for the other.

Mulberry Fibre.

Editor Textile World Record:

Enclosed is sample of fibre obtained from a mulberry tree. Can you give me any information regarding its commercial value? Norfolk (399).

The best authorities state that this fibre is interesting only from a botanical standpoint. It is used by the Indians in the manufacture of ropes, mats and baskets, but no success has been obtained in trying to use it on a commercial scale. The following extract from Dodge's, "Useful Fibre Plants," refers to this mulberry fibre:

The fibre of this species is much used by the Indians for the manufacture of ropes, mats and baskets. A good cloth is made from the fibres of the young shoots. Specimens of the bark and fibre of this species were sent to the Department from Missouri, prepared experimentally by Henry Koenig. Both twigs and sprouts were used, the former giving the best fibre.

Foreign Commission Houses.

Editor Textile World Record:

Where can I get a list of the textile commission houses in Europe? Philip (395).

Agenda Soie et Soieries while relating particularly to silk goods, gives a list of textile manufacturers and merchants throughout Europe. This directory costs $2.50 and can be ordered through our office.

Electricity in Bleached Cotton.

Editor Textile World Record:

The Textile World Record is at hand today. It is a welcome visitor as it always contains much that interests me. Your articles on protection have the right flavor; there is nothing mugwumpish about them and the facts they disclose shed light on this vexed question.

The article in which I am specially interested in this number is that on "Electricity in Bleached Cotton." As you know, I have dyed millions of pounds of raw cotton and ought to know something about its manipulation during the carding process, and I never yet heard of its being necessary to play a hose on dyed or bleached cotton in order to card it, if the carder and dyer understood their business.

In the first place cotton should never be taken directly from the dryer to the picker, but should always be stored in bins in a cool place from seven to ten days that the normal moisture lost in drying may be regained. Cotton loses weight by drying, frequently as much as 4 per cent., and until it has lain long enough to absorb this amount of moisture and return to its normal condition it will not card well, humidifiers or no humidifiers.

Your correspondent says this difficulty with electricity is not uncommon where cotton is dyed and bleached. This may have been his experience, but if it had been a common occurrence in some of the mills I am acquainted with some one would have lost his position. Bleached cotton properly dyed, dried and then aired for a time in bins will give but little more trouble in carding than white stock. I ask Carder (365) to try it and let us hear from him. Roger Williams.

Dyeing Raw Cotton.

Editor Textile World Record:

What are the advantages and disadvantages of dyeing cotton in the raw state which is to be spun into yarn for fine underwear? Knitter (388).

The relative advantages and disadvantages of coloring cotton in the raw stock are summed up by a practical dyer as follows:

The advantage of dyeing in the raw stock is that any amount can be dyed and mixed in one batch, and thus insure a uniformity that cannot be obtained in any other way. In dyeing yarn in the skein it would be dyed in 100 pound lots and there is apt to be slight variations in shade.

As to the disadvantages, the dyed stock does not card as well as the white, and it generally costs a little more and the wear and tear on the card clothing is more. In dyeing raw stock a certain amount of waste is dyed which is a dead loss, that is, what a picker will throw down, card strips, card fly, etc., which will probably amount to 10 per cent., so that from 1,000 pounds of dyed stock one really gets about 900 pounds of yarn more or less.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The market has been visited by buyers for nearly all the large jobbing houses and the bulk of the business has been placed, and manufacturers are now figuring on their condition based on orders taken and purchases of raw material.

Salesmen for lines of wool goods report that a full quota of business has been booked at practically last season's prices, notwithstanding the advance in prices of raw material.

The principal demand has been for natural greys and camels-hair, although an increased call has been noticed for plain colored goods, particularly in light shades of tan, buff, and so-called buck-skin shades. These are taking the place of the darker tan and blue shades that have been selling for the past few seasons.

Some new lines of men's worsted ribbed goods are being offered, and exceptionally good values are being shown at as low as $7.50.

The Cooper Manufacturing Co. are showing a line of merino ribbed goods at $7.50, and several other manufacturers have copied same and report that considerable business has been booked on these lines.

Manufacturers of scarlet goods state that a larger business has been placed than for the past five or six years. There is also an increased demand for percentage goods in grey and camels-hair colors at from $3.75 to $4.00.

Manufacturers of men's 12-pound ribbed goods have advanced their prices from $3.62 1/2 and $3.75, at which the market opened, to $3.87 1/2 and $4.00.

There seems to be plenty of fleeced goods in the market, which indicates that manufacturers of this class of goods have not sold up their production as early as in former years. This may be explained from the fact that prices have been so materially advanced. Goods sold last season at from $2.87 1/2 to $3.00 are now being offered at $3.50, the $3.25 grades of last year are now $3.75, and other priced lines in about the same proportion.

One manufacturer is showing a line of 28-gauge fleeced goods put up in 2/12 boxes with the idea that same will reach the consumer as a 75 cent garment. These are made in Egyptian, salmon, and blue, and it is reported that a fair amount of business has been booked on the line.

Fleeced goods manufacturers are giving considerable attention to export trade, and we were informed by one that he now has orders on his books for England, Scotland, Denmark, Norway, China and New Zealand, but adds that the details for these orders are such as to make considerable extra work in his mill in putting up the goods, some countries buying long sleeves, short sleeves and wing sleeves, some to be opened all the way down the front and others to the waist, and the greater part to be put up in paper packages instead of boxes.

The greatest advances in prices are noticed on the lines of ladies' low priced ribbed goods which advanced from 8 lb. goods at $1.90 for 1903 to 6 lb. goods at $2.20 for the present season. Of course we are aware that many buyers bought 6 lb. goods at $1.90 for 1904, but there are also a great many buyers who refused to place orders at this price, afterwards passed them at $2.00, and have since been pleased to get their orders booked at $2.20. To an outsider it would seem that some agreement had been reached between the larger combinations of manufacturers of this class of goods in regard to prices, as their prices, weights, terms, etc., have been exactly the same throughout the season, the advances being made simultaneously.

Ladies' combination suits made from carded peeler yarn have sold well in 8 3/4 lb.

goods at $4.00, although last season 10 1/2 to 11 lb. goods at $3.75 to $3.87 1/2 were easily obtained.

We believe that scarcely any manufacturers of ladies' ribbed are sold up entirely although many of them have withdrawn their samples, but they have sold to the extent of their yarn purchases, which in some cases will run them into June, July and August.

Hand-finished goods are attracting the attention of manufacturers, and the Southdown Knitting Co.'s line shown by Bateson & Dowd contains some good numbers. They have a medium weight combed peeler garment at $3.75, and a heavy weight combed face and carded back at the same price, with suits of the same cloths for $6.50.

Some jobbers have started their road men, and report having taken some orders for general underwear bills. They report that although much better values are offered in ladies' ribbed goods and boys' fleeces to retail at 29 or 30 cts., buyers are taking the poorer values to sell at 25 cts., which indicates that this is bound to be a popular price.

CHEMNITZ REPORT.

Manufacturers of hosiery and gloves have been very busy for the past few weeks shipping out all the goods they possibly could before the advance of about 33 per cent. freight made by the steamship companies, would take effect.

Prices are firmer than ever, yarns having been advanced to a very high price. Manufacturers, however, have material enough to make up the orders that have been placed up to the present time, and have deferred placing further orders with the spinning mills, anticipating that there will be a drop in the price of yarns before long.

While manufacturers are by no means rushed with orders as they have been in former seasons, still they have enough work, and goods will be turned out promptly, as the production is fully large enough to meet the demand.

Lace hose will be good again for next spring, and orders in fair quantities have been placed, also silk embroidered lace hose are selling well.

In extracted and printed styles the very small dots and fancy spots are finding ready sale. In ladies' hose the demand seems to be for navy, in rather dark shades, with white effects, and fully 50 per cent. of the orders call for this color. In men's half hose navies are bought more than blacks.

Fancy stripes are very slow, and the few houses that are taking them up are placing orders for small quantities only.

The stocks of men's lace half hose are coming down slowly, but have to be sold with a loss.

Plated goods with silk embroidery or fancy stripes are the most popular for men's wear. The demand for plain goods has fallen off.

Manufacturers do not anticipate a very large business on fleece lined goods for the coming fall season, owing to the fact that material is too high and the American trade demands heavy weight goods. Orders may come in as usual on the better grades, but the 25c. article will not be bought to any extent in this market.

Trade is still rather quiet in the glove line, manufacturers being very busy filling their spring orders, and very few orders have been placed for fall.

Knit gloves are comparatively cheap this year, wages being very low, but it is a question as to whether this will make them popular again or not.

A very complete line of cashmerettes with two clasps is being shown, and the fancy lining used makes a very pretty looking glove in most cases, while some are loud and may not be taken up by the general trade.

The fall season in hosiery and gloves opens much later than in former years, as nearly all houses are holding back, awaiting further developments of the market.

Dyeing Machine. Dr. Heinrich Guembel, Lambrecht, Germany, has devised a new dyeing machine based on the well known circulating principle by which the liquor is kept circulating through the material by means of a centrifugal pump. This method of dyeing is extensively used on the continent and its merits are being rapidly recognized in this country.

THE DEVELOPMENT OF THE BUR STAND RINGS.

BY S. X.

(Continued from December.)

This inside plate was soon followed by a universal outside plate, also patented by Tompkins Bros., illustrated in Fig. 8. This is essentially the old inside plate, Fig. 3, as far as the slotted strap is concerned, but the holes are replaced by a circular slot—an in-

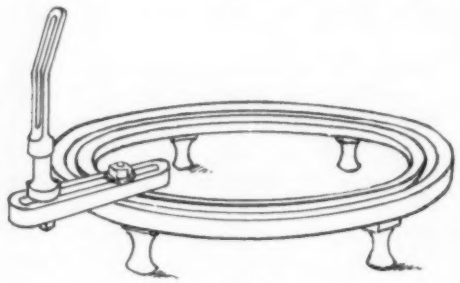


FIG. 8.

finite number of holes in a circle—and the plate is reduced to a ring. This slot was originally of inverted T shape and at one place on the under side a hole was made to receive bolts which were moved around the slot and which held the straps in any desired position. This arrangement was soon displaced by cutting the slot through the plate, except for a few bridge pieces, thus giving two connected rings and making it possible to insert a bolt at almost any desired position, whereas before they could be inserted or removed only at one hole.

The slotted strap is called a link, as it resembles a chain link. If the range of cylinder sizes were smaller, this style of bur-stand ring would be in many respects ideal, for not only is the adjustment universal, but the links may be placed either radial or parallel and close together in groups as is desired for plush work. Both the stand foot screw and link nut are quite accessible. Unfortunately, however, a link sufficiently long to accommodate the desired range of cylinder sizes would not be sufficiently rigid, consequently short links must be used, and for extreme changes of cylinder the diameter of the ring must be changed. The cost of extra rings and the trouble of changing from one size of ring to another are, of course, prejudicial to this combination.

As the outside ring just described took its link from the inside strap, so the old flat inside plate, Fig. 3, took the circular slot from the outside ring, but instead of having the hole for the bolt made in the under side of the plate, it was made in the face of the plate and the nut, instead of the bolt, was introduced in the slot through this hole. This plate was not patented and its use has been widespread in machines having cylinders low on the table, such as the Crane, and Campbell and Clute, both these makers using variations of this plate at the present time.

Returning again to the outside ring, Fig. 8, although it was universal within its range, this range was too limited, as has been stated. In order to meet this objection, the ring shown in Fig. 9 was introduced. This is called the Tompkins patent dovetailed ring. It is an adaptation of the dovetailed inside ring shown in Fig. 7. The link is always radial, a flat foot stand is used and the whole length of the link is available, as there is no interference of the stand with the link bolt as with the plain link. The dovetailed link first used was a broad, clumsy affair that projected inwardly so far that the links could not be brought close together where it was most de-

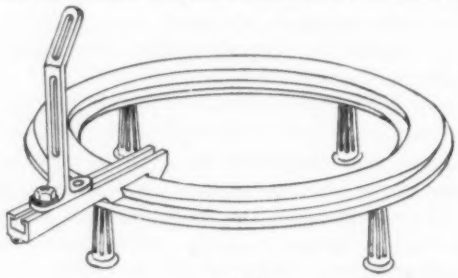


FIG. 9.

sired that they should be close. The link illustrated is a subsequent pattern and permits close grouping of the stands for moderate sized cylinders, but for larger ones the grouping is not close, as the outer ends of the links must of necessity be some distance apart. The radial range of this link is increased by making the stand foot extend in opposite directions from the upright, a hole being drilled in each end, so that one-half the stand foot may

overhang either end of the link for extreme cylinder sizes.

The property of a constantly radial position possessed by this link is desirable in that it allows circumferential adjustment without loss of other adjustments, but it is undesirable in not allowing parallel grouping of the links. That this link is not suitable for a round foot stand is also against it.

For some time these two last described rings were the only outside bur stand supports on the market. Then came a reversion to the slotted ring and even slotted plate that was quite remarkable. It was brought about by the use on the slotted ring of the double link, box link, or two-story link, as it is variously called. This link was invented at different times by three different employees of one concern. The first made a model, the second made a drawing, the third made application for a patent, and thereby obtained title to the device. Fig. 10 represents the first, Fig. 11 the next and Fig. 12 the patented link. With these links the link bolt slides in the lower story and the stand bolt in the upper story. In this way interference of the two bolts is avoided and the range of the slotted ring shown in Fig. 8 is more than doubled.

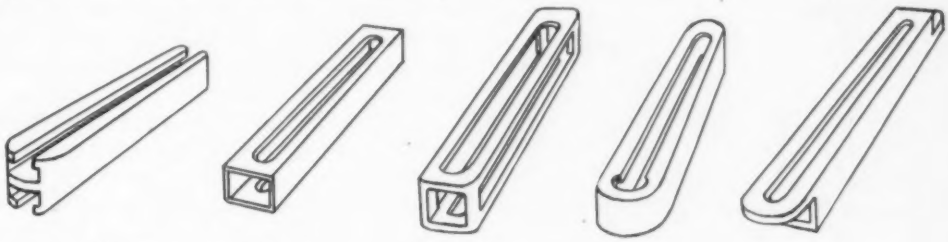


FIG. 10. FIG. 11. FIG. 12, FIG. 13. FIG. 14.

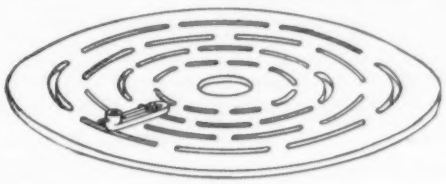


FIG. 15.

In each of these three improved links the link bolt nut is on the under side of the ring instead of above the link, thus necessitating well bowed bridge pieces in order to give access to a wrench when the link happens to come over the bridge piece.

Moreover, a round foot stand cannot readily be used without making the link not only open sided, as in Fig. 11, but very high, and either change reduces the rigidity of the link.

Notwithstanding the inventions of this device it remained for Terwilliger & Co. to put it on sale. The Terwilliger link differed from the others in that the bolt heads were inserted through an enlargement at the end of the slot instead of through the end of the link. Fig. 13 shows the Terwilliger link. Contention over the right to use this style of link resulted in an agreement between Terwilliger and R. W. Gormly, the patentee, that the former should pay royalty to the latter. Tompkins Bros., however, claimed that this device infringed their patented link, shown in Fig. 8, and brought suit against Terwilliger & Co., which suit was recently decided in favor of Tompkins Bros. The inside plate illustrated in Fig. 7 was also involved in this suit and the patent was sustained, but it expired before the decree was entered.

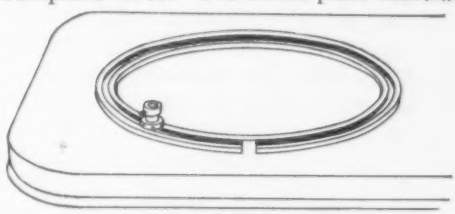


FIG. 16.

During the litigation over the double link, the one shown in Fig. 14 was put on the market by R. W. Gormly & Co. It differs from the others in having one story overhang the other, to facilitate introducing the bolts. It was used on a ring similar to the Tompkins ring, Fig. 8, except that two parallel cir-

cular slots were used instead of one. By the use of two slots the bridges belonging to each slot could be staggered, so that when the link nut came over the bridge of one slot and was thereby inaccessible, the bolt could be removed to the next slot, where the nut would have a clear field. In this way the use of excessively arched bridges was avoided and one serious objection to the double link was removed. In its place was the less serious objection of having to change the bolt from one slot to the other.

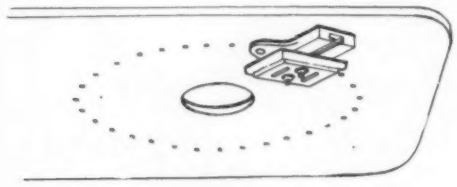


FIG. 17.

About this time the old slotted plate returned to favor, but with the slots circular instead of radial, and on this was used a slotted strap having a vertical socket at one end to receive the stand. This plate is universal and rigid, and one plate serves for the entire range of cylinder sizes. It has the disadvantage of the one just described, that the link bolt must be changed from one slot to another at times, but it has an advantage over the other in being available for a round foot stand, for the socket stand is equivalent to a round foot stand. Fig. 15 shows this plate. It was put on the market by Chas. Cooper. Application for the patent was made by C. J. Sibbald, but this application was put into interference with one of R. W. Gormley's on the plate with parallel circumferential slots having staggered bridge pieces, and as the latter claim covered the essential features of the Sibbald device and the application was prior to Sibbald's the latter's application was refused. It was also disclosed that before the introduction of the Sibbald plate by Cooper, R. W. Gormley had used a similar plate on his machine, in which the needles and burs moved in opposite directions. The link used was not, however, like Sibbald's.

While these improvements were being made in machines having a supplementary table or ring, the machines not so equipped were making improvements on lines of their own.

Fig. 16 shows a ring used by the Crane Mfg. Co. This has a slot with inclined sides, the bottom being wider than the top. Instead of being on legs, however, it is secured directly to the table. There is no link, as change of cylinder size is not contemplated. Although this ring is simple and rigid and has the advantage over its predecessor of independent motion for each stand, it has not the flexibility of the universal plates, in which the stand may be placed in any desired position, and also be placed or removed without disturbing other stands.

A new device used by Campbell and Clute is shown in Fig. 17. It is the old stand bed shown in Fig. 5, but placed on a link having a radial slot, the link being screwed to the table. A circular row of holes is drilled and tapped to receive the link screws so that the link may be placed in any position around the circle. For different aggregations of stands different plates are used, according to the number of slots required.

Stockings with White Soles.

Editor Textile World Record:

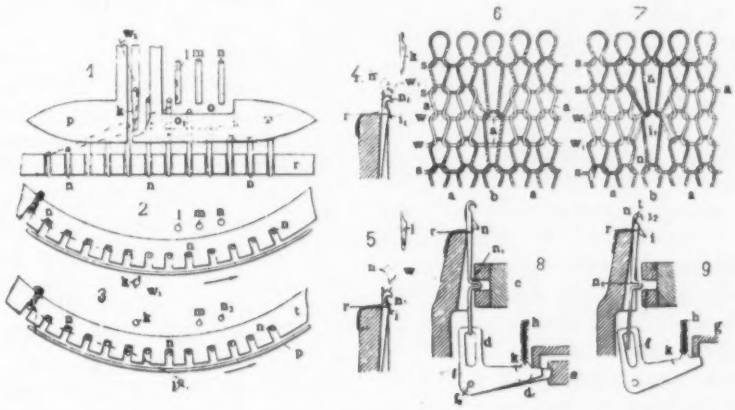
Are latch needle knitting machines built that will knit stockings with white soles instead of white feet? I am aware that white soles are knit on the Shaw and Cotton machines and would also like to know if they are knit on the latch needle bar machine similar to the Lamb knitter.

Durham (401).

An experienced knitter writes us that the Paxton and O'Neill 3/4 automatic machine will make white soles. This is a circular latch needle machine and the knitting of the white sole was accomplished by using two different lengths of needles, one-half short and the other half long. The cylinder was made longer and there were two cylinder cam rings each operating its own set of needles, and in knitting the foot the two cam cylinders were both in operation and worked back and forth as a heel and toe are made on a circular machine. As there were of course, two feed guides, one carrying the black thread and the other the white, one half of the needles would be knitting black yarn and the other half the white yarn. The joining of the white and black threads at each side was accomplished by putting two of the long needles where the short ones began and vice versa, so that they overlapped each other on each side. This made a perfect join just as on a flat machine or a Cotton's patent.

FIGURED EFFECTS ON A CIRCULAR MACHINE.

The accompanying drawings illustrate a method recently brought out in Chemnitz for knitting figured effects on a circular machine. It enables stripe effects to be obtained without the use of a special plaiting thread. By present methods figured effects have been obtained by working several threads of different colors in such a way that each thread is carried one or more times completely around the machine. By this new method the thread forming the cross line is transferred so that it appears to displace the loop of another color. By this means horizontal stripes can be made of one color or such stripes formed of alternating colors. By this method it is possible to adapt the machine to many more patterns than are possible with the ordinary machine.



The attachment for the new process can be applied to any circular knitting machine. The principle of the new method is that single needles are thrown out of action for such time as may be desired, during which no new loops are formed on them. Figs. 6 and 7 show the knitted fabric formed with rows of black or white stitches (sw and swl). Each tuck stitch (b) is formed by having the needle for (b) in a different position from that of the needles used for the plain stitches (a). They carry along the back yarn (s) and are thrown out of action when the white thread (w or wl) is brought into play. The feed of the white yarn is regulated so that it is not laid in the same position, but is passed behind or under the other thread and then lies on the back side of the goods as shown at Fig. 6, behind the black loop (a), or it may be thrown in the form of a loop as shown (rl), where it is carried by the needle of (il) in Fig. 7. In this position it is not looped by the eye of the needle and consequently is not brought to the face of the goods.

The other diagram shows parts of the device for this method of knitting. Fig. 8, the needles (n) are raised and lowered by the cam (c) in the usual manner. Below they are connected with the swinging arm (d) of which the other end (dl) is held by the carrier (e) as is usual in hosiery knitting machines. For the needles (n) which are to form the pattern, levers shaped like (f) are provided. These do not extend to the carrier (e) but rest against the ring (g) and are connected with the spring (h). If the pattern needle is to be thrown out of action a sample chain raises the ring (g, Fig. 9). This allows the spring to raise the arm (k) and the other arm (f) swings to the left, throwing the needles (n and nl) out of the cam (c) and at the same time bringing the upper hook (n2) to one side. This action takes place when the needles are in working position where the old loop (e) still remains on the needles.

The thread guides (k, l, m, n, etc., Figs. 1 and 2) are supported side by side within the needle cylinder (n) and when the working guide (k, Fig. 2) is outside of the row of

needles. A guide (k) which carries the threads forming the bulk of the fabric is placed at the beginning of the row of guides and the other guides (l, m, n) are placed to the right in the direction in which the cam moves. The other threads are guided first over the edge (o) in the corner of the needle plate (p), passing to the needles so as to form a stitch in the usual way.

The thread guides for the pattern needles (nl) can rest in two positions while the yarn of one color is being knit. If they are high as (l) in Figs. 1 and 5, and the edge (o) is at the same level, the deflected thread (wl) passes over the head of the pattern needle and behind these needles because they lean outward. If the guide rests in a low position as at (k), Figs. 1, 2 and 4, the slanting thread (wl) comes forward to the needles in the open hooks, Fig. 4, and remains there forming the loop. After several rows of stitches (wl) have been formed on the loop (il) the needle again comes into action. This throws the loop (il) with the stitch (wl) over the new stitch Fig. 7 and the stitch (wl) thereby passes to the back side of the goods. When the guides (l, m, n) hang low and the edge (o) is also depressed to the position (ol) the guide lays the threads as shown at (k). In this way the pattern shown at Figs. 6 and 7 is formed.

If the pattern needles have been thrown out of action for several rows the guide being out of action while one or more of the other guides have been supplying fancy rows (h) the pattern chain then lowers the ring (g, Fig. 9). This presses down the arm (dl) and throws the arm (f) with the pattern needle back into the cam (c), while the pattern chain throws the guide carrying the pattern thread into action. The pattern needles then form loops in the same way as other needles. If the pattern needles are brought into action while carrying another thread the stripes are formed with alternating and not continuous colors.—Uhland's Technische Rundschau.

Burr Cylinder. Klein, Hundt & Cie, Dusseldorf, Germany, have recently brought out an improved burr cylinder for woolen cards, which, it is claimed, gives very much better results than have heretofore been obtainable.

MY EXPERIENCES IN KNITTING MILLS.

BY F. W. HERINGTON.

In January, 1872, at the age of thirteen, I entered the employ of John Blacklock, whose office was in Toronto, Ont., Canada, but who owned and operated a knitting mill, manufacturing men's all wool underwear, at Hastings, a small village 26 miles north of Colborne, a station on the Grand Trunk Railway, about 100 miles east of Toronto. Colborne was the nearest railway station then, and Hastings was reached by stage from there, which took about 7 hours time, from 10.30 in the morning to nearly 6 o'clock in the evening.

I was employed as office boy, and thus obtained, at an early age, a practical knowledge of bookkeeping and correspondence in a manufacturing business. Nothing of interest occurred during these first years, except I might say that with a friend I took up the study of shorthand, using the system of Isaac Pitman, who I believe was the inventor of shorthand. At any rate it was the only system in those days, and all the others now in use were copied from his, with some alterations thought to be improvements. I mastered it and obtained my diploma in 1877.

In 1877, John Blacklock secured one of the "Maritime Family Knitting Machines." The printed matter of the circular describing this machine is, I think, very interesting, as it mentions a large variety of knitted goods that could be made on this machine, including socks, ladies' hose, flat web, afghans, tufted work, scarfs, mittens, fringe and cord. A machine like that would now be considered a very crude affair.

With this machine, which used "latch" needles and was for plain knitting only, began my first experience in knitting and knitting machines.

From this machine, after nearly 3 years' work of experimental changes, improvements, alterations and additions, a new machine was evolved, which was called the Universal knitting machine. The most important improvement or addition was made in the upper part, which was a cone shaped dial, capable of taking the same length of needle and the same needle as those used in the cyl-

inder, whereas all the rib machines of today (except the Lamb circular machine, which has a cone shaped dial, the reverse of the Universal, which sets down inside the cylinder) have flat dials, which necessitates the use of a shorter needle.

By having the same length of needle in both dial and cylinder, it will be seen that the needles could be transferred from one to the other without transferring the stitches, and thus if every other needle in the cylinder was transferred to the dial, the machine produced a 1 by 1 rib, and then if every other of these needles in the dial were transferred back to the cylinder, a 3 by 1 rib was made, the transferring of the needles being done by hand, in fact the machine then was only a hand machine.

It will be seen that this machine was capable of making first a welt, then a 1 by 1 rib top, either a 3 by 1 leg, or a plain leg, a plain foot, or the 3 by 1 rib could be continued down the front of the foot, or other combinations of rib and plain work as desired, without transferring the stitches from one set of needles, or from one needle to another, simply by transferring the needles with the stitches upon them.

This cone shaped dial was the principal part of the machine, which was patented in Canada, United States, England and Germany. This feature has not been reproduced on any other knitting machine, the nearest to it being the Lamb, as stated.

Another advantage of this cone shaped dial was that the stitch of the dial needles would draw the yarn from the yarn guide for their own loops, and thus form their own loops without robbing from the loops of the cylinder needles, with the result that both sides of the rib knitting thus made was exactly alike; there was no right or wrong side to it. In all the dials used on rib machines today, which are flat, the yarn is fed over the dial needles to the cylinder needles which draw their stitches first, and then the dial needles in drawing their loops rob from the cylinder loops, with the result that the inside or back of the rib thus made is not the same as the outer or right side.

In July, 1878, the office in Toronto was closed, and I went to the mill at Hastings, taking with me the Maritime machine, which I was then working on for improvements. Then began my first experiences in a knitting mill, manufacturing men's underwear from the raw material, wool, which included picking, carding, spinning, knitting, scouring, boarding, finishing, packing and shipping the finished goods. The Davis & Furber machinery for picking, carding and spinning was used at that time, but the self-operating mules had not then been brought out. The spinning frame was called a jack and was operated by hand, except of course that the spindles were driven by power, but the drawing of the yarn and the winding of the yarn on the bobbins after spinning was all done by the spinner. I worked on the jack quite a number of nights, and also days when the regular spinner would be out from sickness or other causes, and thus obtained a practical knowledge of spinning woolen yarn for knitting underwear.

The spinning mule of today is automatic in all its operations, and it does not require as much skill now to be a spinner. The spinner in those days had to know exactly how to draw different kinds of wool stock, as he had to draw out the jack and spin the yarn while the spindles were running by power, and then when the required twist was put in and the spindles stopped, had to back off, and wind the yarn on the bobbins, which was done by a crank in the centre of the machine, operated by the hand of the spinner.

The spring needle knitting machines were the Campbell & Clute make, and it was on these I got my first experience in spring needle knitting, the Maritime machine having latch needles. For sewing machines the old Grover & Baker bent needle machine was used for seaming, and the straight needle Grover & Baker for finishing. Both these machines had a lower hook, used two seaming threads, and made an elastic lock stitch. The high speed Wilcox & Gibbs chain stitch, single thread machine, was just beginning to be used by knit goods manufacturers. The Grover & Baker Co. was afterward absorbed by the Domestic Sewing Machine Co., and only old knitting mill men now remember the Grover & Baker sewing machines for seaming and finishing.

Strictly all wool goods were made; no shoddy or cotton was bought or used. Only the clippings from the cutting were run through a shoddy picker, and this stock coming from all wool cloth, was still good wool and was mixed with the batches of wool.

The production of the mill averaged from 10 to 12 dozen shirts and drawers per day, the one set of cards and the jack being run night and day. This is a very small production compared with that of the mills today which are considered small, and yet I venture to assert that the net profits made from this 10 to 12 dozen per day were larger than some of the mills earn now whose production is 100 dozen per day. This profit was made notwithstanding the fact that all the raw material, as well as the finished goods and supplies, had to be carted 26 miles from the railway station nearest the mill. The teamster went out to the depot one day and returned the next. Later a branch railroad was run through Hastings from Belleville to Peterborough.

Stage coaches carried the mails, small parcels, and passengers. There were two stage coaches, one in, and one out so we had a daily mail, but it took them nearly all day to go the 26 miles. They left Hastings at 10.30 a. m. and arrived in Colborne at about 5.30 p. m. The time was the same the other way, and in winter it was a long, cold ride.

(To be continued.)

Hosiery and Underwear.

One of the successful and energetic firms in the wholesale hosiery and underwear trade is Ellis Brothers, located at 434 Market St., Philadelphia. They started in business in October, 1894, nine years and five months ago, with a limited capital, in a private house at 607 South Ninth St., using the parlor as a show room. By giving strict attention to business and always on the alert to please their customers they gained their confidence, and have grown steadily and today their business is extensive. One thing that speaks well for this firm is, that they hold their trade, many of their customers doing business with them since they started. They are now pressed for room at their large store, 434 Market St., compelling them to seek additional quarters. Plans have been made to erect a storehouse, a three-story brick building, 18 by 100 feet, in the near future. They invite manufacturers to show their samples.

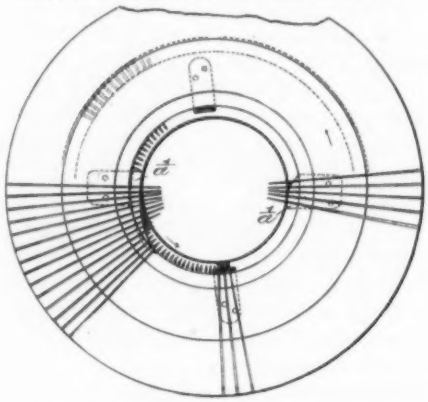
The Co-operative Knitting Works, Ruberstein Bros., proprietors, whose mill is at 378 Wallabout St., Brooklyn, N. Y., are opening an office on Broadway, New York City, where a full line of their specialties in the way of ladies' golf blouses, vests, sweaters, etc., will be shown. They are now operating 25 knitting machines and are about to add five more to keep up with their orders.

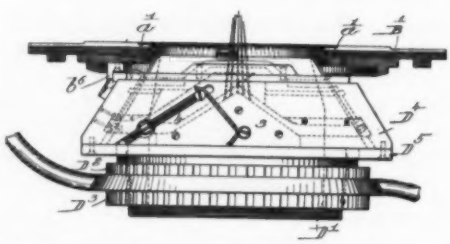
The Pottstown Hosiery Print Works at Pottstown, Pa., started in business about a year ago, in March, 1903, as printers, painters and extractors of hosiery. It has a business that requires special technical knowledge and experience. In September a dyeing department was added, which has proved most successful. In the coming April it expects to dye fast black, lisle finish. The rapid growth and success of this business is the best evidence that it is pleasing its customers. It guarantees its work and invites correspondence and trial orders.

Recent Knitting Patents.

KNITTING MACHINE. 748,219. Charles A Santmyers, Philadelphia, Pa.

KNITTING MACHINE. 747,988. George A. Leighton, Manchester, N. H., assignor to Leighton Machine Co., Manchester, N. H.



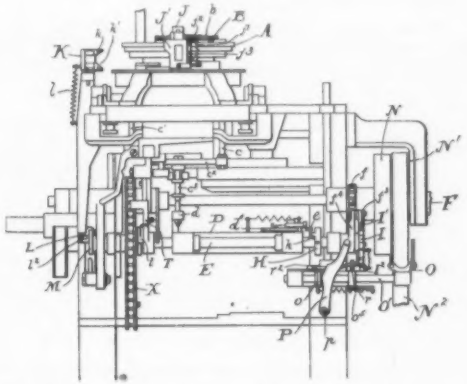


This invention in knitting machines has for its object the production of a knitting machine by which to knit a pile fabric. The fabric is composed of different threads, some of which are manipulated or interknitted to form a rib fabric, while another thread or threads are interknitted with the rib fabric to present a series of knitted wales at one side thereof, lying between the knitted wales of the ribbed fabric. To produce this fabric in one good

way, a circular knitting machine is taken having a series of cylinder-needles and a series of dial-needles and having applied thereto between the dial-needle bed and the cylinder-needle bed a conical needle bed containing a third series of needles, shown as of the latched variety, and a conical shell having suitable cams to actuate said third series of needles. The third series of latch-needles are for interknitting the pile-thread into the rib-knitted fabric, and they cross diagonally the paths of movement of both the dial and cylinder needles and take thread from a thread-guide located within the space bounded by the cylinder-needles, interknitting said thread with the rib-knitted fabric made by the dial and cylinder needles, leaving the pile-thread on one side of the ribbed fabric in the form of loops arranged in wales between the wales of the rib-knitted fabric.

KNITTING MACHINE. Automatic Circular. 749,933. John B. Hipwell, Philadelphia, Pa. assignor to Windsor Machine Co.

KNITTING MACHINE. Circular. 749,062. Harry A. Houseman, Philadelphia, Pa., assignor to Standard Machine Co., Philadelphia, Pa.



This invention has for its object certain improvements in circular knitting machines provided with needles for the purpose of automatically preparing the machine for transferring. By preparing the machine for transferring is meant that when the machine is on rotating work it throws the thread-carrier out of action, so that if there is any work on the machine at that time the loops will be removed from the needles, or if no work is on the needles the thread-carrier will be moved out of the line of the needles and out of interference with the transferring, bringing the needles to a common level for the reception of the new work and stopping the machine. Previous to this invention machines have been prepared for transferring by hand. This takes considerable time and also involves the use to a certain extent of skilled labor.

KNITTING MACHINE. Lamb. 750,052. Arthur Greaud, Angiers, France.

KNITTING MACHINE NEEDLE. 749,686. John C. Egly, Philadelphia, Pa., assignor to Keystone Knitting Machine Co.

KNITTING MILL NEWS.

New Mills.

*Canada, Toronto Junction. T. Prest is president of the Enterprise Hosiery and Underwear Company recently reported incorporated and operating a plant at this place. William Smith is vice-president and general manager, and R. A. O. Hobbs, secretary. A new building 100 by 50 feet has been erected and equipped with eight knitting machines, with complement of sewing and finishing machinery. Goods will be sold direct.

*Georgia, Montezuma. The new plant of the Montezuma Manufacturing Co., which will be operated on women's underwear, has been completed and it is expected operations will begin about the 15th of January.

*Illinois, Chicago. The Perfect Knitting Mills, incorporated with capital stock of $25,000, will manufacture all kinds of sweaters for men, ladies, boys and children and cardigan jackets. Isidor Natkin is president and S. E. Newberger, buyer. They will operate 30 machines and sell goods direct.

New Jersey, New Brunswick. The New Brunswick Knitting Co. has been incorporated recently with capital stock of $10,000, with H. H. Fuller, president; John F. Brooks, secretary and treasurer. They will manufacture infants' and children's high grade all wool hosiery and will sell product direct.

*New York, Brooklyn. The Sterling Knitting Mills, reported recently incorporated, will start operation January 1st, making sweaters, blouses, shawls, bootees, jerseys, bathing suits, etc., for men women and children. Samuel Schiendelman is president of the company, and Herman Schiendelman, treasurer. Plant is operated by steam. Goods are sold direct.

Enlargements and Improvements.

Connecticut, Winsted. The Winsted Hosiery Co. has increased the capital stock from $150,000 to $200,000.

Georgia, Columbus. It is reported that the Georgia Manufacturing Company will make extensive additions to the plant for purpose of manufacturing yarns. At the annual meeting held recently C. L. Perkins was elected president; H. M. Wade, vice-president; T. K. Peabody, treasurer; Charles Doughtie, superintendent of the knitting mill and J. W. Boyd, superintendent of the pants factory.

Illinois, Rockford. The Rockford Knitting & Hosiery Company has increased the capital stock from $300,000 to $600,000.

Massachusetts, Boston. The Boston Knitting Mills have been incorporated with a capital stock of $15,000, with Samuel Mann, president, and Isaac Cohen, treasurer.

Massachusetts, Ware. A stock company is to be organized to operate L. P. Deslauriers' hosiery mill. Additional machinery has been ordered, which will increase output to 200 dozen pairs of hosiery a day.

New Hampshire, Ashland. The Ashland Knitting Company has purchased one-half the water

power belonging to John Merrill and in the spring will erect a new power house in which the electric lighting plant will be installed for lighting the company's mill.

New Hampshire, Manchester. The Riverside Hosiery Mills contemplate installing new machinery in the plant.

Tennessee, Lenoir City. The Dixie Mills are making preparations to enlarge the plant. They will erect additional building 100 by 100 feet, 2 stories, and will add 150 new machines (ordered) and employ about 200 more people.

Pennsylvania, Towanda. The Towanda Knitting Company has been organized with George W. Kipp, president, W. J. Young, secretary, and George J. Jonhston, treasurer. They will operate the plant formerly run by W. J. Young. Additions and improvements will be made.

Pennsylvania, Williamstown. J. W. Durbin & Son have installed several new Hemphill full automatic knitting machines and Ruth ribbers in the plant.

Utah, Ogden. The Ogden Knitting Company has absorbed the Home Knitting Company's plant. New Company has been incorporated with capital stock of $30,000 and located in the building used by the Ogden Company. David C. Eccles is president of the new company; D. O. McKay, vice-president, and W. Z. Terry, secretary and treasurer.

Utah, Salt Lake City. The Western Knitting Co. is making general improvements to the plant. New buildings will be erected and additional machinery installed.

*Wisconsin, Sheboygan. The Sheboygan Knitting Co. has started work on erection of addition which will be used exclusively for manufacturing sweaters.

Mills Starting Up.

*Connecticut, Plainville. Operations have been resumed in the Plainville Mill, with Arthur Hawley as secretary and general manager of the plant.

*New York, Cohoes. Operations have been resumed in the Empire Knitting Mill.

New York, Cohoes. Operations have been resumed in the Tivoli Mills.

Pennsylvania, Honesdale. The Maple City Knitting Mills, manufacturing sweaters, have resumed operations after having been closed since middle of December.

*Pennsylvania, New Ringgold. Messrs. Saul, Bible & Young, formerly at Pottsville, Penn., have started operations in their new mill at this place manufacturing hosiery.

Mills Shutting Down.

Indiana, Elkhart. The Lakeside Knitting Co. is making preparations for closing the branch mill at this place. The machinery will be kept in place so that operations may be resumed at any time.

Michigan, Port Huron. Operations have been suspended in the branch mill located here by the Progressive Knitting Mills of Detroit.

*New York, Mechanicville. The plant of the Mechanicville Knitting Company still remains closed.

Facts and Gossip.

Connecticut, Naugatuck. The Dunham Hosiery Company have adopted the American Moistening Company's system of humidifiers in their carding and knitting department.

Massachusetts, Wakefield. Winship, Boit & Company have equipped their knitting room with the American Moistening Co.'s system of humidifiers.

Pennsylvania, Philadelphia. The Roxford Knitting Co. has installed two Gem universal electric machines in its cutting room to cut knit shirts and drawers.

Pennsylvania, Pottsville. Muehlhof Bros., who purchased the business of W. K. Boltz last June, are manufacturing the same line of underwear as heretofore.

*South Carolina, Blacksburg. The Blacksburg Spinning and Knitting Mills reported to be sold at auction, have been purchased for $8,000 by A. H. Pollock and J. W. Rhyne of this place.

Wisconsin, Kenosha. At special meeting held recently by the directors of the Chicago-Kenosha Hosiery Co., Frank Slossom was elected general manager to succeed Willis Cooper, who was lost in the Chicago fire.

*Wisconsin, Racine. It is reported that efforts are being made to consolidate the Stevens' Point mill and the Racine Knitting Works with the knitting works at Beloit.

Personals.

E. M. Pratt has been promoted to boss winder in Wright's Mill, Pownal, Vt.

Martin Howard, of Copenhagen, N. Y., has engaged as superintendent with the Rosenau Hosiery Mills, Tuscaloosa, Ala.

James W. Pilkington, dyer, has resigned his position at the Raleigh Hosiery Co., Durham, N. C.

S. J. Browne is the new superintendent at the underwear mill, Greenwich, N. Y.

Arthur E. Thomas has severed his connection with the Hay & Todd Mfg. Co., of Ypsilanti, Mich., to take charge of the finishing machines of the Eagle Knitting Co., Ltd., Hamilton, Ontario.

Edward Botter is overseer of knitting at the Beaver Knitting Mill, Hudson, N. Y.

Charles C. Sixby has retired as manager of the Fort Wayne (Ind.) Glove & Mitten Co.

Herbert Taylor has resigned his position as assistant superintendent at the Alling Mills, Derby, Conn., and has now a position with Yund, Kennedy & Yund, Amsterdam, N. Y.

Samuel Melbourn has accepted the position of boss spinner of the Lackawanna Mills, Scranton, Pa.

A special meeting of the directors of the Chicago-Kenosha Hosiery Co. at Kenosha, Wis., was held recently to elect successors to the late Willis W. and Charles Cooper, managers of the plant, who were killed in the Chicago fire. Frank Slossom was elected general manager, to succeed Willis Cooper. George H. Curtis and Henry Cooper were elected to fill the vacancies on the board of directors.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Rubber Rollers for Wool Scouring. The Boston Belting Co., Boston, Mass., are placing on the market an improved rubber roller for wool scouring. A description will be found in another part of this issue.

Multiple Needle Sewing Machine. L. F. Fales, Walpole, Mass., has recently built a number of 120-inch multiple needle sewing machines, each employing from 10 to 30 needles. These machines are believed to be the largest of the kind ever built. A more extended reference to them will be found in another part of this issue.

Bleaching Cloth in the Open Width. The H. W. Butterworth & Sons Co., Philadelphia, Pa., have recently brought out an improved process for bleaching cloth in the open width, a description of which appears in another part of this issue.

Hank Indicator. The Standard Indicator Co., Boston, Mass., are placing on the market an improved hank indicator made with the American standard gauge, pitch of thread, etc. An illustrated description of this device will be found in another part of this issue.

Ball Winder for Noble Combs. Hoyle & Preston, Keighley, England, have brought out a new balling machine which, it is claimed, requires less space than other machines of its kind, and will supply a larger number of combs. Labor is economized by a clean and more compact ball which as a consequence does not require replacing so often in the comb. It is said that each winder will keep ten combs supplied with wool, there being 28 to 30 pounds of wool in each ball.

Hosiery Scouring Machine. The Leicester Laundry Machinery Co. have adapted for scouring hosiery a machine that they have been building for a number of years for regular laundry work. It is said that excellent results have been obtained in scouring, bleaching and dyeing hosiery and other small wear. The machine consists of a barrel of hard wood bound with hoops. Inside the barrel are lifters which stir the liquor as the barrel revolves. The goods are subjected to a gentle rubbing during the scouring process.

Anti-Marriage Device for Mules. Societe Lietard & Cie, France, have recently brought out a device for preventing double ends on mules. As is well known, adjoining ends are apt to unite when one breaks, causing a two-ply thread to run on the bobbin. This double end very often escapes notice, goes into the cloth and causes much damage. It is claimed that the new device prevents this trouble entirely.

Cloth Measuring Apparatus. White, Child & Beney, Vienna, Austria, have recently placed on the market an attachment for measuring cloth as it is being woven. It is said to be simple and reliable and can be used for nearly every kind of work.

Separator for Ring Spinning and Twisting Machines. Die Elsassischen Maschinenfabrik, Mulhouse, Germany, have recently brought out a device for preventing double ends on ring spinning and twisting machines which consists of a swinging plate placed between the ends. This plate can be swung out of the way when cleaning or doffing the machine.

Trimming Machine for Looms. Die Elsassischenbau Maschinenbau-Gesellschaft, Mulhause, Germany, is placing on the market a device for trimming the loose ends of filling which are left hanging to the cloth in the loom. The machine is automatic and keeps both edges of the cloth trimmed as the operation of weaving is carried on.

BALL BEARINGS FOR TEXTILE MILLS.

Friction increases with any increase of pressure. That simple proposition is well known to every one, yet it is surprising how many ignore it when considering the loss of power from friction on the shafting of mills and machinery. They note or measure the power required to drive the mill shafting without the machinery, and then conclude that the same amount is consumed when the load is on. Such a fallacy would not be accepted for an instant when one holds the hand on the rim of a moving pulley. The increase of friction with any increase of the pressure of the hand is noted at once. The principle is the same in all cases regardless of the kind of surfaces in contact. In the bearings of shafting any increase of the load increases the pressure and friction in the bearings and, consequently, the power required to drive the shafting. The larger the load the larger the loss of power.

The power lost by the frictional resistance of shafting in textile mills varies widely in different establishments. Tests made in fifty textile mills by John T. Henthorn some years ago showed an average loss of 26 per cent. Kent in his handbook gives the results of tests in various establishments, showing a loss as high as 80 per cent. The average throughout the country is estimated by good authorities at 40 per cent. Estimating the total power consumed in the textile mills of the United States at 1,900,000 H. P., this is equal to a loss of 800,000 H. P. At $25 per H. P. per year, this means a yearly loss of about $20,000,000 due to the frictional resistance of shafting in our textile mills.

The only way to reduce this enormous loss is to reduce the friction. With the most carefully lined shafting and the best journal bearings the loss will continue to be very large. The reduction of friction with ball bearings is well known, but the objection to their use for heavy work has been that they would not stand the wear and tear. This is a real difficulty with the ordinary bearing, but an improved ball bearing was invented several years ago and has been improved and thoroughly tested on heavy shafting with the most satisfactory results.

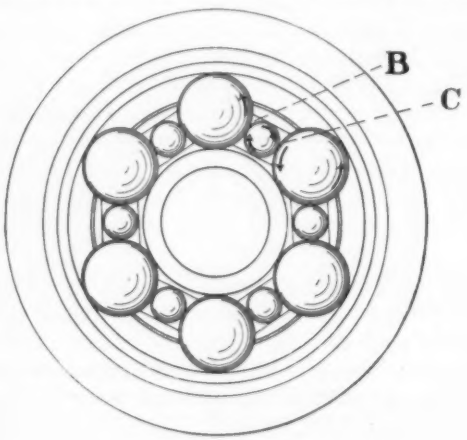


FIG. 1.

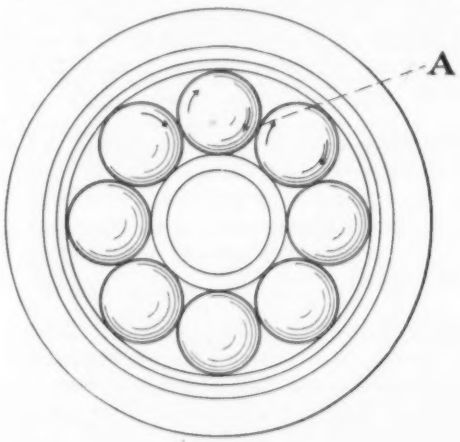


FIG. 2.

This bearing, which is manufactured by the Chapman Double Ball Shafting Bearing Co., 255 Atlantic Ave., Boston, Mass., differs materially from the ordinary ball bearing as will be seen by a comparison of the sectional views of both types at Figs. 1 and 2. A perspective view of the Chapman bearing is shown at Fig. 3. The difference in the two bearings will be understood by referring to the arrows, which show the direction of the surface movement of the balls. In the old style bearing the pressure comes on all the balls and at the point of contact (a), the movement of the two surfaces is in opposite directions, causing a friction that consumes power and results in the rapid wearing of the balls.

In the Chapman bearing every alternate ball is smaller in size, and rolls between the adjoining balls of large size, on which the working pressure is brought. By referring to the arrows at Fig. 2 it will be seen that the movement of both surfaces at each point of contact is in the same direction. The balls thus roll against each other, instead of rubbing as at Fig. 1.

We lately witnessed a comparative test of the ordinary journal bearings and Chapman ball bearings in which the pressure was gradually increased in each case to 8,000 pounds.

FIG. 3. THE CHAPMAN BALL BEARING.

The increase of the load was indicated by a General Electric watt meter in circuit with the motor. The motor required 5 hectowatts.

Following are the results:

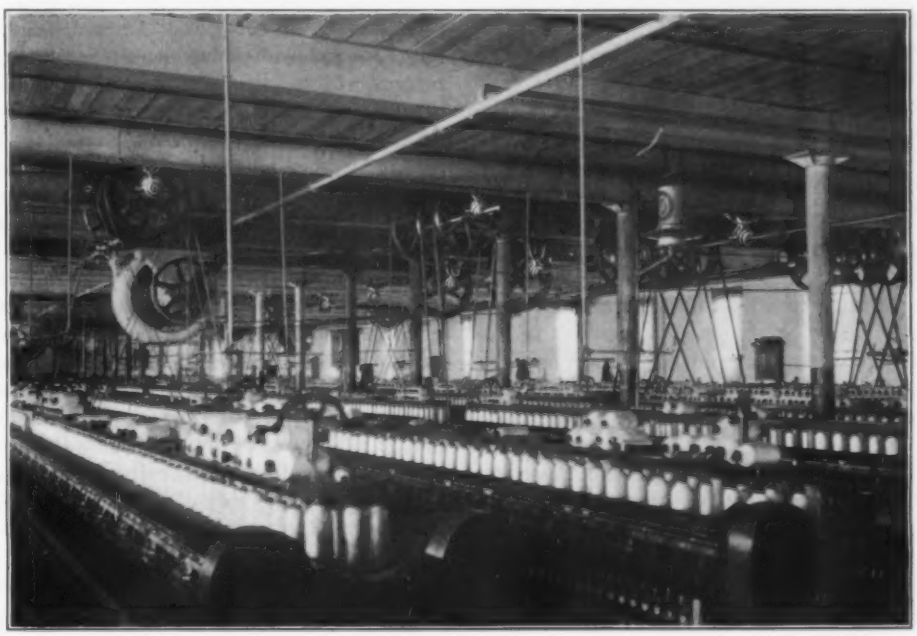


FIG. 4. SPINNING ROOM, LANCASTER MILLS, CLINTON, MASS., EQUIPPED WITH THE CHAPMAN BEARINGS.

Weight.	Journal Bearing.	Ball Bearing.
No load	11	5½
500 lbs.	13½	5¾
1,000 lbs.	15	5¾
2,000 lbs.	16½	5¾
3,000 lbs.	17	6
4,000 lbs	18½	6
5,000 lbs.	20	6½
6,000 lbs.	21	6¾
8,000 lbs.	23½	7½

Deducting the power required for the motor we find that with the pressure from the belt alone the journal bearing consumed 6 hecto watts; the Chapman bearing ½ hectowatt, or 92 per cent. less. With an increase of 8,000 pounds in the pressure, the journal bearings consumed 18½ hectowatts; the Chapman bearing 2½ hectowatts, or 86 per cent. less.

Another advantage of the Chapman bearing consists in the three points of contact between the balls and the rim of the bearing. A third advantage lies in the fact that the bearing has been thoroughly tested in textile mills. It has been running for several years in the Orswell and Parkhill mills at Fitchburg, Mass., and in the Lancaster mills at Clinton, Mass. Fig. 4 shows a section of the spinning room at the Lancaster mills in which the shafting is equipped with the Chapman bearing. The results in these mills have been so satisfactory that the manufacturers of the Chapman bearing feel certain of its durability and invite the closest inspection by textile manufacturers.

Improved Filling Stop Motion. Robert Pickles, Burnley, England, has recently brought out a new weft fork called the "Tandemite." The prong end of the fork is fulcrumed to a separate pin and acts independently of the hook part for operating the stop motion. The two parts work in conjunction with each other by means of two projections, and it is claimed that an increased leverage imparts a more sensitive action without undue strain.

Silk is the only material used for clothing which Mohammed introduces among the luxuries of Paradise.

THE MONEY VALUE OF SOFT WATER.

Some manufacturers make a very comfortable profit out of their saving in waste. There are certain kinds of loss and waste that are apparent to a most superficial observer, and if they are not corrected a manufacturer has no one to blame but himself for these constant losses, but many a manufacturer who really believes that he has stopped every leak, is unconsciously losing money every day in invisible and unthought of wastes. A striking instance of this came to light a short time ago, when it was discovered that a firm of manufacturing chemists in London had during the past 25 years thrown away as waste product a residue from which the new and enormously expensive element radium is extracted. This is a loss for which, of course, they cannot blame themselves, because its value was unknown, and so in a way textile manufacturers are not to blame for many wastes which are unknown to them.

One of the unappreciated and oftentimes unknown sources of waste is in the water used in the mill. Every manufacturer knows the desirability of pure and soft water. Some mills whose goods are famous for the beauty of their finish attribute a portion of their success to their water supply, but while recognizing the benefit of good water, the actual money lost from hard water is not often recognized. This is sometimes strikingly brought out when a new process or system is introduced and comparisons made, as in a recent instance which has come to our attention in a Western mill, where the results, through the introduction of a water softening system, are remarkable.

Soap is an important item of expense in the finishing department. The lime salts in 1,000 gallons of water will destroy 1.7 pounds of the best hard soap for every degree of hardness, and as water frequently ranges in hardness from 10 to 20 deg., Clark's scale, it can be easily seen how much soap has to be used to neutralize water before it will begin to do the work for which it is intended. Moreover the insoluble curd, on account of its greasy nature, sticks to the fabric and cannot even be removed by rinsing with hot water, making the goods dull, dirty and, under some conditions, spotted.

But it is not only in the finishing room that the loss by injurious effects of hard water is a real waste. Some colors combine to form insoluble compounds with the alkali earths and may be precipitated altogether. Where hardness is due to earthy bicarbonates, such water is not suitable for the solution of many of the coal tar colors, because a portion of the color base is precipitated, and the dyestuff is wasted. The basic colors and mordant colors particularly and some other dyestuffs are precipitated by lime, magnesium and iron, and are not only wasted, but if enough of the precipitate is formed, tends to spot the goods. Dyestuffs are expensive enough when their full value is obtained, without using them for water softeners. Iron, if present to any extent, detracts from the brightness of alizarine reds, and the yellowing of cotton goods is often caused by this same trouble. Iron also causes trouble in wool scouring, bleaching and other operations, as ferric oxide is precipitated upon the fibre, and the goods acquire a yellowish tinge, which is a poor bottom for the dyeing of bright colors.

Besides these sources of trouble from hard water in the processes of textile manufacture, the loss of heat and power, due to the formation of boiler scale, is such a well known difficulty that it is generally recognized, and attempts to correct this locally by means of boiler compounds have produced very unsatisfactory results.

The most common impurities and at the same time most objectionable are the carbonates and sulphates of magnesia and lime, oxides of iron and alumina, and a process which will remove these impurities, gives in almost all instances a water supply which is practically perfect for general textile purposes.

The great railroad systems in the Middle States and West were confronted with the problem of hard water in its most serious form, for in no class of boilers is trouble caused with hard water as much as in locomotives. It is in the field of railroad work that the Kennicott water softening process was first exploited, and hundreds of installations have been made under most severe conditions at the watering stations of the great railroad systems of the West. Incidentally, numerous installations have been made in industrial plants, and the striking advantages which resulted from the installation at the Mankato Mills led to the study of the conditions in the textile industry, with the result that they are confident of accomplishing equally satisfactory work in this line.

A water softening system, in order to be of value, needs to be simple in its action, certain in its results, reasonable in first cost and economical in operation. The Kennicott system of softening water consists of automatically treating varying quantities of water with varying quantities of materials (always in the same proportion), in an automatic apparatus which purifies and softens the water at the lowest possible cost.

The Kennicott water softener, as this apparatus is called, is continuous in its action, automatically starting and stopping with the beginning and ceasing of the flow of water into the apparatus.

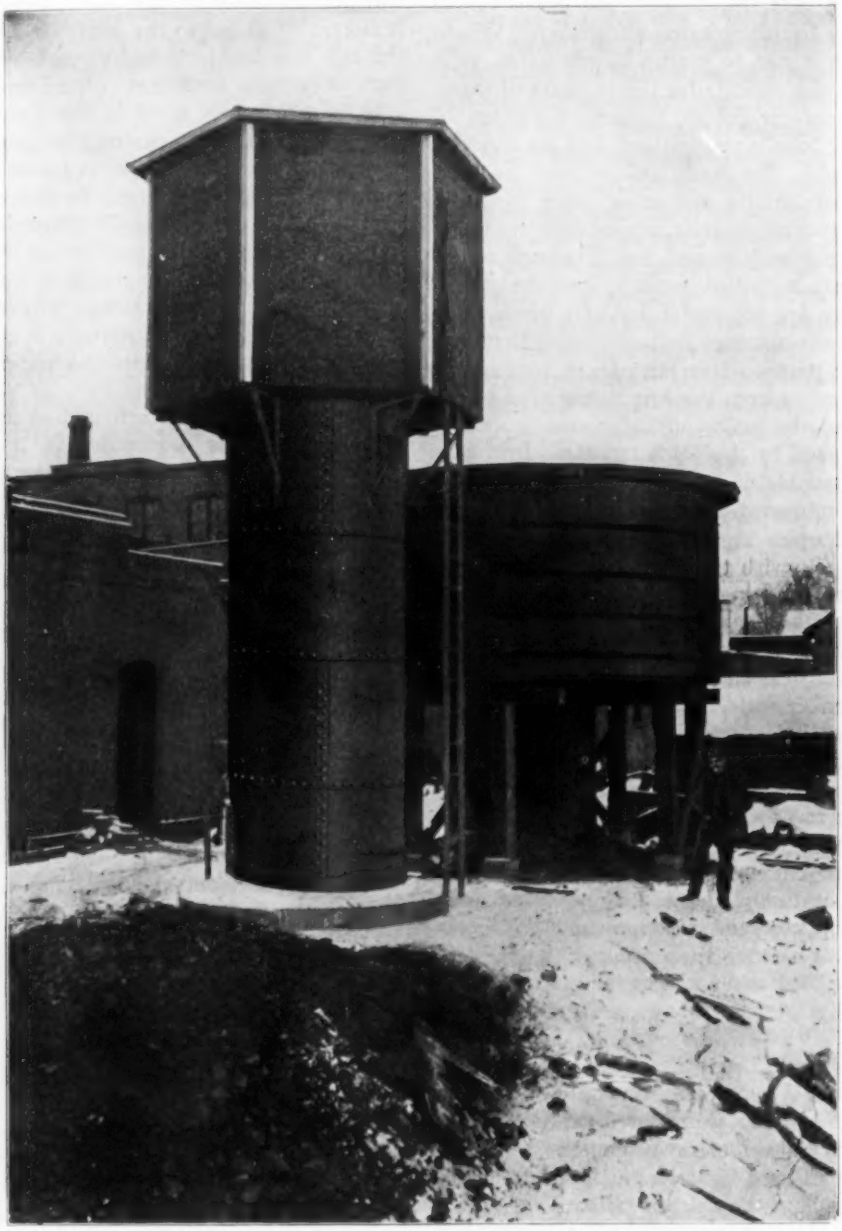
The water is pumped but once into the softener, and is delivered at the top. The water as it flows into the softener furnishes all the power the apparatus requires, both for elevating the chemical reagents to the top of the machine, and for mixing them properly with the water to be purified, as well as for operating automatically all the mechanism of the apparatus.

After the impurities in the water to be treated have been precipitated from the water by the chemical reagents, they are automatically removed from the water as it passes through the apparatus, and the purified water overflows from the top of softener by gravity into the storage tank, without the necessity of repumping.

Every Kennicott water softener is built expressly for the particular needs of the water which it is to treat, after that water has been thoroughly analyzed and the proposed treatment carefully outlined by their chemists.

The illustration shows the plant recently installed at the Mankato Woolen Mills Company of Mankato, Minn. This has a capacity of 750 gallons an hour and softens the water from a flowing artesian well. It has been found that the hosiery is softer and more lofty and entirely free from harshness and wiry feel-

ing, which they were unable to avoid before the water was softened. They find that with a production increased 75 per cent. over preceding year that the cost for soap is no more. They have noted a saving in dyestuffs and in the brightness of the colors and the frequent previous necessity of redyeing. They found that owing to the hardness of the water, their dyes, which under ordinary conditions should have been absolutely fast, were not so, but with softened water, much better results were produced, and the colors are brighter and



THE KENNICOTT WATER SOFTENER PLANT, MANKATO, MINN., WOOLEN MILLS CO.

attractive. The softened water is used for all purposes throughout the plant and its benefit in the boilers is very apparent. The experience of other mills using water softener systems of various makes, all tends to corroborate the fact that whenever the water supply is not soft, there is a constant unappreciated waste, that is brought strikingly to light by the installation of a softening system.

The builders of the Kennicott water softener system analyze samples sent to them by express prepaid, without charge, and manufacturers who are not sure of the quality of their water supply might with profit have it thus analyzed and satisfy themselves that they are not unconsciously losing money in this way.

BROKEN GEAR TEETH.

Broken teeth are undesirable anywhere, especially in a loom vibrator gear. One broken tooth in such a gear will put the whole machine out of business, and make it necessary to take it out of the vibrator, detach the gear from its connector and lever, and

THE CHEVRETTE VIBRATOR GEAR.

replace with a new gear, or braze on a tooth and then reassemble all the parts. This takes time, money, labor and patience and is more or less unsatisfactory. To remedy these difficulties in repairing broken teeth in vibrator gears, Homer F. Livermore, Boston, Mass., offers the Chevrette vibrator gear. If a tooth in this gear breaks it is only necessary to remove the broken portion and replace it with a false tooth made for the purpose. Such repairs can be made without loss of time and without breaking up the combination.

The Chevrette gear has been thoroughly tested with such results that Mr. Livermore feels warranted in claiming that it affords the best, cheapest, quickest and easiest method of repairing broken vibrator gears. Much loss of time and production is avoided by equipping mills with these gears. Further particulars about this device can be had upon application to Mr. Livermore, who also deals in other specialties in this line, including loom repair parts in general.

THE STEWART ADJUSTABLE BURR STAND TUBE.

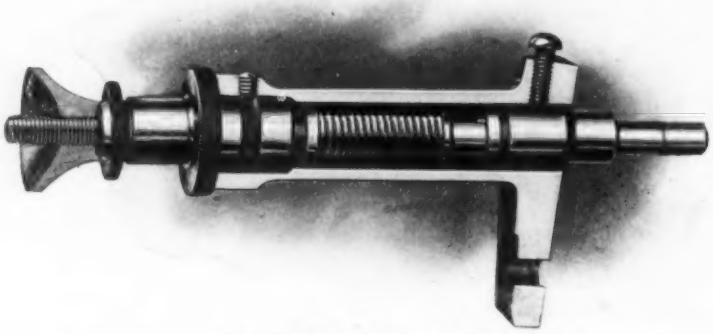
The accompanying illustration shows a part section of the Stewart patented adjustable burr-stand tube for circular spring needle knitting machines. The shaft is supported by a sleeve at the burr-end and by a bushing at the nut-end. The sleeve has a feather way to take the shaft feather and the bushing has a telescoping thimble which regulates the tension on the spring.

Rotary adjustment of the shaft is obtained by loosening the round head machine screw and turning the shaft by means of the cup-nut at the end of the shaft. The spring tension adjustment is obtained by loosening the headless screw and turning the bushing by means of the knurled rim, thus moving the telescoping screw-thimble in or out of the bushing and decreasing or increasing the spring tension as may be desired. The shaft may be drawn back until the feather is out of the feather way and then given a partial turn to retain it in that position. The adjusting nut and cup-nut are so constructed that they may be securely locked by hand, thus preventing accidental changes in the adjustment.

The workmanship and design of this tube are superior in every respect. The shaft is ground and fitted with a Whitney patented key pinned securely in position. The sleeve is also ground. The adjusting screws are both on top of the tube where they are conveniently accessible, and both being on the same side of the shaft there is no tendency to cramp the shaft when they are tightened.

The bushing adjusting screw is made with a hanger point so that the bushing never

loses its position, no matter how often it is adjusted. This tube not only reduces to a minimum the time lost in making changes, but it materially reduces the needle breakage and consequently bad work. The facilities for adjustment and excellence of the workmanship do away with the trouble caused by having springs too tight or too loose, by burrs improperly set for want of facilities to set them, by the binding and cramping of roughly turned shafts, by accidental changes in the stitch owing to the absence of a lock nut, etc. The Stewart tube is partially owned and exclusively controlled by Tompkins Bros. Co., of Troy, N. Y., and is supplied on all their standard spring needle knitting machines.



THE STEWART BURR STAND TUBE.

IMPROVED RUBBER ROLLER FOR WOOL SCOURING.

The objections to the ordinary rubber roll wrapped with cloth or roving for wool scouring are so well known that they need not be emphasized here. The roving is expensive and needs frequent replacing. This requires considerable time, during which the machine is idle, and usually the repairs must be made when the machine is needed most. Solid rubber rolls have been used for a long time and given good satisfaction except that in some cases, owing to the heavy strain, the covering has become ruptured after a short time, necessitating a new and expensive covering. A good squeeze is essential in scouring wool and nothing has been found so well adapted for this purpose as the rubber covered roller. It is resilient, requires little attention, and is most satisfactory and economical provided it is strong enough to stand the service incident to wool washing.

The Boston Belting Co., Boston, Mass., which has long manufactured rubber rolls, has recently offered to the trade an improved type of rubber roller which has been designed to overcome the objections that have been made to the ordinary type. It is known as the Forsyth patent reinforced rubber roller, and is shown at Fig. 1. Simplicity and strength are the prime features of the construction of these rollers. The body of the roller has dovetail ribs, which are accurately planed to a standard template as shown at Fig. 2. The rubber rings, Fig. 3, are carefully molded of high grade rubber and have dovetail grooves corresponding to the ribs on the body. Each ring is reinforced with layers of heavy duck put in edgewise, and in addi-

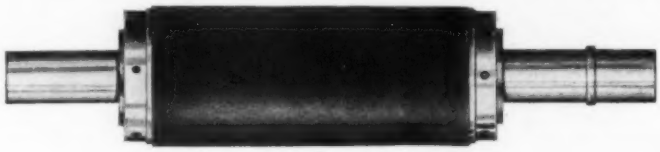


FIG. 1. RUBBER ROLLER FOR WOOL SCOURING.

tion has two malleable metal rings molded next the inside to prevent any stretching of the rubber ring when under pressure. The rubber rings are slightly dished on the sides, Fig. 4, and under the pressure of the clamping rings the former grip the metal rings of

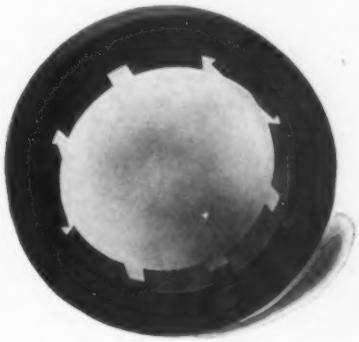


FIG. 3.

the body firmly, locking the whole into a perfect roller, possessing great strength and resiliency. There are no parts to rust or become loose. All parts are interchangeable

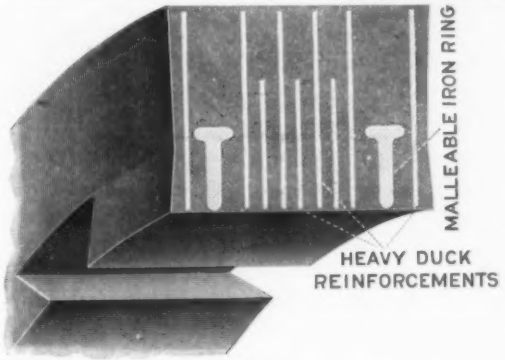


FIG. 4.

on rollers of the same diameter. These rollers are made any regular diameter and any length of face, and no expense has been spared to make them superior and high grade in every respect.

It has been fully demonstrated by actual use that this roller will successfully withstand the hard service which a roller is likely to

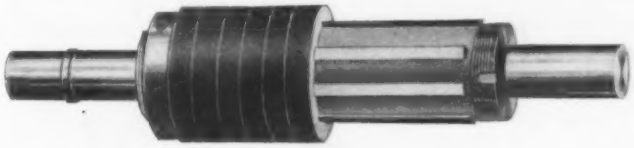


FIG. 2.

receive in a wool washing machine. One of its strongest features is that if the covering is injured in any one place, it can be easily and quickly repaired by replacing the damaged rings with new ones. In fact, an entirely new covering can be applied without skilled help or expensive tools. Extra rings can be kept on hand and the roller maintained in good condition at slight expense. This type of roller is particularly well adapted for raw cotton dyeing, wool carbonizing, etc., and in every other place where thick coverings are required and the service is severe.

CONTINUOUS CLOTH EXTRACTOR.

Extracting the water from wet pieces by a continuous process of running them between squeeze rolls has advantages which every finisher will recognize. The treatment is uniform from one end of the piece to the other, and as the process is entirely automatic the only help required is an attendant to feed the machine and watch the work. The uniformity of this treatment is in marked contrast with the irregular results obtained with the centrifugal machine when the work is left in charge of the average workman. Tests made some years ago in a New England mill to determine the amount of water left in cloth by the centrifugal extractor showed that the water varied from 54 to 86 per cent of the weight of the cloth. This irregularity was not the fault of the machine, but was caused by the carelessness of the attendant.

When it is considered that every pound of water left in the goods means a pint of water to be evaporated by the dryer, the importance of thorough and regular work is apparent. Again there is no question but some colors are materially affected by the conditions of heat and moisture in the drying process, and

variations in the shade of different pieces may be due in some cases to carelessness at the extractor.

The Rodney Hunt Machine Co., Orange, Mass., have recently perfected a continuous cloth extractor or wringer which, it is believed, will extract the water thoroughly and uniformly. This new machine is for either light or heavy goods and for certain grades serves also as a perfect hydro-extractor. One mill manager stated to the builders that he would rather have one of these new wringers than half a dozen of the ordinary centrifugal type. The fact that the new wringer costs some 35 per cent. less is an additional point that will interest manufacturers.

THE RODNEY HUNT CONTINUOUS CLOTH EXTRACTOR.

The accompanying illustration shows the general appearance of the new wringer, as well as an additional rinse box which is sometimes used. It is claimed that cutting of the goods is absolutely prevented by the use of a wooden top roll, similar to those used in the washers made by this company, and an improved folding mechanism folds the goods for the dyer. This feature alone is a money saver and is being quickly recognized.

The pressure upon the rolls is obtained by screws operated by hand wheels. It is said that in many cases a considerable amount of water can be removed from goods that have been previously extracted in the ordinary centrifugal hydro-extractor.

Another special feature which is sometimes furnished, is a steam drying and pressing device in connection with a "spreader" whereby the smaller creases are removed just before the goods are passed through the main wringer. Where vertical space is not available and the rinse box is not desired, the makers furnish a "low rig" folder which makes the machine very compact and allows it to be placed in a very confined space. Like all other machines made by this company these wringers are furnished on trial. Further information regarding it may be had upon application to the builders.

AN IMPROVED HANK INDICATOR.

A large number of drawing and spinning machines are already equipped with hank indicators, but in view of the usefulness of this device it is surprising how few manufacturers have attached it to their machinery. It makes an accurate record of production by which the help are paid. It also shows the efficiency of each machine. At the close of each working day the overseer can copy the figures from each indicator on a blank ruled for that purpose, and in a few minutes have a record of the work of each machine for that day. This report can then be laid on the superintendent's desk showing him each morning what was done on each machine the day before. This is an invaluable means of detecting the weak places of a mill, showing how the different kinds of work are running and keeping the production at the maximum.

THE STANDARD HANK INDICATOR.

The Standard Indicator Co., Boston, Mass., are manufacturing an improved hank indicator, shown in the accompanying illustration; for simplicity and accuracy they believe this indicator to be unexcelled. Many thousands of these indicators have been imported from abroad, and the style is probably too well known to need a description in detail. While originally intended for roving frames on this side of the water, they have been used not only on roving frames, but also on mules, spinning frames, twisters, and other machines where the delivery of the front roll is recorded by hanks. This indicator differs from the foreign device in many respects, being made on the American standard as to gauge, pitch of thread, etc., which enables the purchaser to go into the open market and buy repair parts when necessary.

As these indicators are made on a most improved system, each part being interchangeable, they are offered to the trade at a less price than the imported article, and we are advised by the manufacturers that sample indicators will be sent on approval to interested parties.

There is probably no part of a machine in textile mills that is more neglected than the hank indicator. The manufacturer will discard his platform scales and weigh his cotton on the old-fashioned steelyards in order to in-

sure accuracy, while he seldom considers the accuracy or construction of the hank indicator. There is no question that great advantages would result from the extension of the use of the indicator. If textile manufacturers will study the possibilities of this device, we are convinced they will not only recognize its advantages for the uses to which it is now ordinarily applied, but find it to be applicable to many other purposes. The writer has used the hank indicator for measuring the length of sliver wound on spools for dyeing, and was thus able to get the same quantity on each spool, a great advantage in obtaining uniform colors. This illustrates the varied uses of this device and we advise textile manufacturers generally to give the matter their careful attention.

WAGES IN BARCELONA MILLS.

The following list of wages paid in the Spanish cotton mills has recently been published by the Famento del Frabajo Nacional, of Barcelona:

Workers	Weekly Wages.
Mill managers	$5.80 to $7.30
Overseers	5.10 to 5.80
Engineers	5.80 to 7.30
Machine tenders	1.76
Spinners	3.64 to 4.37
Doffers	.97 to 1.12
Winders	1.76 to 2.22
Weavers	3.64 to 5.10
Mechanics	3.64 to 4.37

Barcelona mills have been involved in many labor troubles during the past year. In some cases the demand has been made for higher wages and shorter hours, but more frequently the disputes were caused by a demand for recognition of the union and that all negotiations with the operatives should be conducted through the committee appointed by the labor unions.

The requirements of the inland Arabs, who are usually supplied with goods through Bussorah, are few and simple, consisting principally of cotton prints for clothing, cotton and silk handkerchiefs for head coverings, sugar, coffee, and enameled ironware.

NEW PROCESS OF BLEACHING IN THE OPEN WIDTH.

Cloth can be bleached much better in the open width than in any other form. When the pieces are opened up the selvages are kept straight and the surface of the cloth is not cracked or wrinkled as is likely to be the case when it is crumpled into rope form. Heretofore cloth has been bleached in the open width in jiggers or by running the pieces continuously through tanks. The last named method is slow and laborious and no pressure is brought to bear upon the cloth.

The machine built under the Jackson and Hunt patents by the H. W. Butterworth & Sons Co., Philadelphia, Pa., is designed to overcome the methods of open bleaching while retaining and increasing the well known advantages of this method. The cloth is prepared for the subsequent processes on the machine shown at Fig. 1. It consists of a cast iron cistern from the sides of which is carried a large perforated drum. The cistern is filled with caustic liquor and the cloth passes round the drum and becomes thoroughly saturated. A perforated steam pipe is fixed close to the drum at the bottom, and serves the purpose of heating the liquor and driving it through the cloth as it travels with the drum. A pair of strong batch arms are fixed on top of the cistern and the necessary feeding rails at the top of the machine. One preparing and batching machine is sufficient to deal with the production of two or three kiers.

The roll of cloth is then placed on the wagon as shown in the illustration of the kier at Fig. 2. The kier is horizontal and made of steel plates to stand a pressure of 60 pounds per inch. The wagon loaded with cloth is run into the kier and the door closed, being swung into position by the crane above the kier. When the door is closed and the kier ready for work, the caustic liquor is run into the kier by means of the centrifugal pump, steam pressure is applied until a pressure of 40 pounds is obtained, and the cloth is wound from one batch roller to the other and vice versa for two hours, at the end of which time it is thoroughly bottomed. A lever is fixed in convenient position for reversing the motion

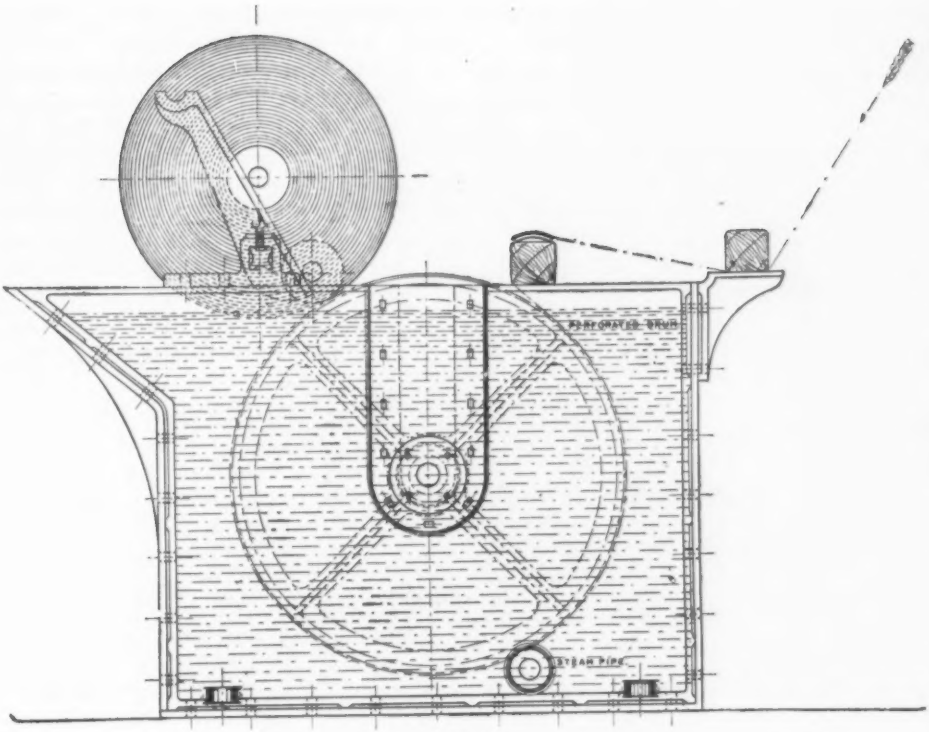


FIG. 1.

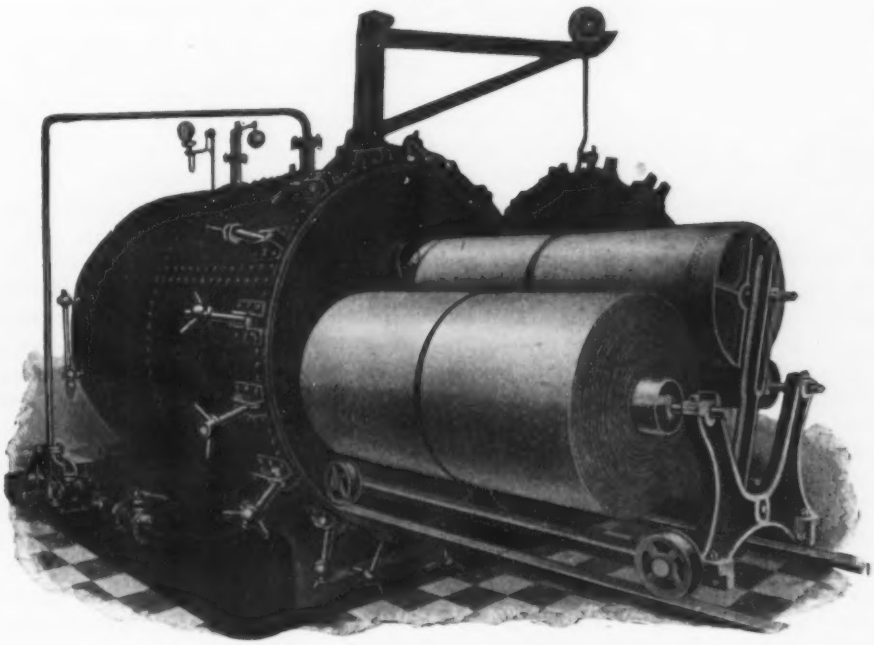


FIG. 2. OPEN BLEACH KIER.

when the batch rollers are empty within a few yards, the attendant receiving due notice from a gong which is sounded automatically by mechanism connecting it with the interior of the kier.

When removed from the kier the cloth is taken to the chemicing and scouring machine shown at Fig. 3, where it is passed from one roll to another during the process. B 1 and B 2 are the two batches which work in journals carried by the machine sides. P D is the perforated drum carried by the oscillating levers or arms, O L. These arms are free to move from side to side, being journaled at J, and the arms having an open jaw at the top, the drum, P D, adjusts itself to the increasing and decreasing size of the batches as the cloth is wound on and off. This motion is most important as it keeps the cloth always at the same tension and absolutely free from creases. It also brings considerable pressure to bear on the rotating batches and squeezes the liquor through the cloth. The cistern sides are provided with hinged doors for convenience in removing batches. The spurt pipe, S P, is used for washing when the acid or other liquor is removed from the cistern.

This process of bleaching has been thoroughly tested with excellent results. Further information regarding it can be obtained upon application to the builders of the machine.

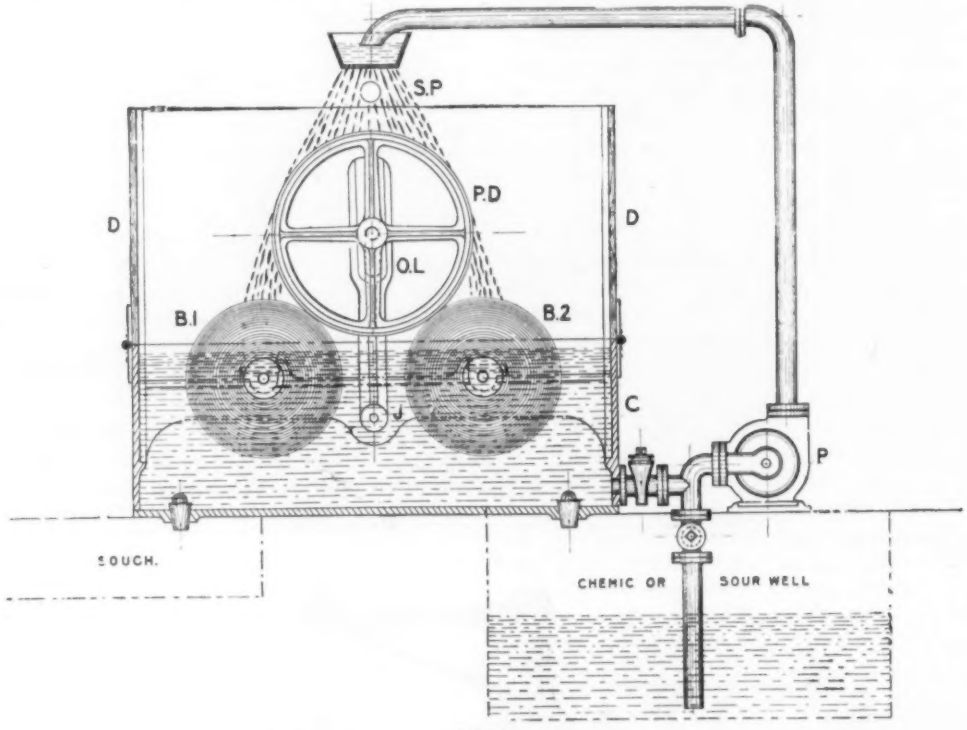


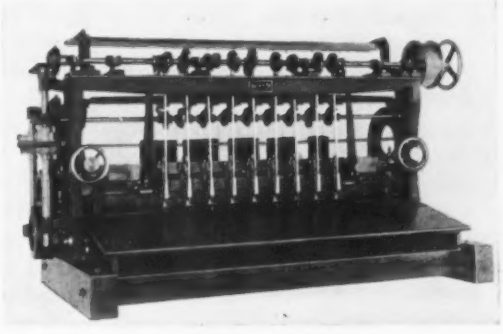
FIG. 3.

Size Boiling and Agitating Machine. Z. Holden & Co., Accrington, England. A device for keeping the size agitated while it is being boiled. The pipe is formed in an open helical coil and mounted on a steam and water-tight bearing. This coil is turned by means of an endless screw. It is also claimed that the device can be used to good advantage in dye jigs where the liquor is used at a boil while the material is being treated.

The survival of the fittest is shown in the fact that the most valuable commercial fibres of today, flax, cotton, hemp, wool, and silk, were the prominent fibres of ancient times.

MULTIPLE NEEDLE SEWING MACHINE.

Several of what are believed to be the largest multiple needle machines ever built have lately been delivered by L. F. Fales, Walpole, Mass. They are to be used in sewing material one inch thick and have a capacity of 120 inches in width, with from 10 to 30 needles taking a stitch from 1 to 1 1/2 inches long. This machine is very heavy, weighing about 1500 pounds, and is built only to order. Mr. Fales thought he had reached the limit of size when he built the 100-inch machine, but he has exceeded this size in the new machine by 20 inches.



THE FALES MULTIPLE NEEDLE SEWING MACHINE.

The material on machines of this nature must be kept moving constantly, and this is done by feed rolls which are large enough to reach the whole width of the machine and are driven by a powerful drive. The needle bar is of the maniplex type and moves in unison with the material. Considering the size of the machine it is capable of very rapid work. Folders, pressers, etc., are built to go with these heavy sewing machines.

Mr. Fales is very busy with his regular lines of sewing machines which are mostly of the chain stitch type. He has recently made improvements in these machines which now enable him to carry them almost complete in stock, and he can make a delivery in a week or ten days after receiving an order stating the number of needles, distance apart, and length of stitch required.

He has lately sold several machines for quilting material used in the manufacture of mittens, particularly in the West. These machines are generally furnished with needles about two inches apart. He has recently brought out the lock stitch machine shown in the accompanying illustration and designed especially for quilting horse blankets. It can be used for any goods where a number of rows of stitches are required. This machine has the two outside needles adjustable so they can be moved while the machine is in operation. This is an advantage where hemming is required as the needle may be moved to follow the edge while the machine is in motion, continuing to sew at the same time. This is done by turning the hand wheels in front of the machine. The machine can be furnished without the adjustable needles if desired. They are built on the same line as the chain stitch machine with the maniplex type of needle bar which has proved so successful. The shuttle is capable of carrying a large quantity of thread and the machine is first class in every way.

Screen for Card Cylinders. Klein, Hundt & Cie, Dusseldorf, Germany, are placing on the market a vibrating rack to be placed under the cylinders of woolen cards to allow the shives and other foreign matter to drop on the floor while preventing the escape of the fibre.

The first attempt to print calico in London was in 1676.

Dyeing, Bleaching, Printing, Etc.

THE USE OF THE SUBSTANTIVE COLORS IN SILK DYEING.

For many classes of silk fabrics, or fabrics made in part of silk and other fibres, and specially goods that are not likely to be subjected to severe washing, the substantive colors offer many advantages over other colors, but principally from the fact that the use of boiled-off liquor is entirely dispensed with.

The substantive colors dye level, the very mode of applying them to silk assures this result, while the brilliancy of the shades obtained is only limited by the quality of silk used.

Unlike nearly all other classes of colors used for silk dyeing, these colors go on the fibre quite slowly and in the first stage of the dyeing process do not exhaust completely, but the bath is exhausted by the addition of a very small quantity of acetic acid.

Light shades are best dyed in a bath containing about 5 per cent. of acetate of ammonia. The silk is immersed, and if yarn, is turned regularly while the temperature is gradually raised. During the increase of temperature the bath practically exhausts, when the yarn may be lifted, washed and dried. If medium shades are being dyed and the bath does not exhaust completely, the addition of 2 per cent. of acetic acid will clear it up in a few moments.

For dark shades the dye bath is best charged with about 10 per cent. of Glauber's salt, dyeing the yarn in the same manner as for light shades, but adding 5 per cent. of acetic acid in several successive portions during the dyeing operation. This procedure will ensure level dyeing and absolutely no waste of color in the dye bath.

The acetate of ammonia is easily prepared by the dyer by neutralizing 100 parts of acetic acid into about 60 parts of aqua ammonia, noting the exact point with a piece of litmus paper.

In the manufacture of chenille goods, which is one of the principal outlets for silk noils, a very large number of attractive shades are required, and in the dyeing of this class of silk no better process can be adopted than to use the substantive colors. Of course, not all these colors have equal fastness to light, but as these fabrics are used largely for interior decorations, the use of these easily dyed colors is to be recommended.

The range of shades produced varies from a pale yellow to a deep black, and includes all the fashionable shades of violets, scarlets, blues, greens, pinks, browns, drabs, etc., and can include the endless line of mode shades.

For silk stripes in suitings, such classes of fabrics as are not milled, these colors will meet every demand, as the fastness to nearly all influences is quite sufficient to meet the dress goods requirements.

The appliances for dyeing are the same as for ordinary yarn, with the exception that the sticks should be very smooth.

THE DISCHARGE PRINTING OF COTTON PILE FABRICS.

Of recent years this class of goods has gained very wide popularity on account of the low cost at which they can be purchased, compared with the prices that ruled, say ten years ago. This lower cost has been attained in a great measure by the many improvements that have been made from time to time in the coloring of these fabrics, whether in the dye-house or in the print-shop, for each branch of work has been subject to a number of radical changes so that at the present time, the entire process for dyeing and printing is to be regarded as simplicity itself.

Technically, the grey cloth, as it comes from the loom is ready for the dyeing without any special treatment, but it is better to always hot plate the goods, thereby ensuring perfect results. After this preliminary treatment, the goods are wetted out, and at once dyed. The usual, and always the most satis-

factory class of colors to use on the direct—salt dyeing—colors, for the reason that the boiling necessary for the dyeing ensures perfect penetration of the pile. To apply these colors, the jigger is the best machine to employ, because it enables the dyer to make use of very strong solutions of dye stuff, thus effecting a saving in color, and also dyeing the full shade required in a somewhat shorter time.

Ground or body colors, when used for plain goods require to be selected chiefly for their level dyeing qualities. As far as possible they should be pure dyes, and not mixtures, for the reason that dye mixtures do not exhaust uniformly, and when standing kettles are to be maintained, the shade of the material from the sixth or eighth kettle will be somewhat different from that of the first kettle, unless toning is resorted to by the dyer.

When discharge effects are to be produced, then the dyer must work in perfect harmony and understanding with the color-mixer and printer, so that the discharges and discharge colors will show up properly on the ground color as dyed by the dyer.

All direct dyeing colors do not discharge white when printed over with a white discharge, consequently a choice of colors should be made after experimental tests have been completed, and no changes or modifications in their composition should be permitted.

After having been dyed, the fabrics are washed and dried, when they are ready for the printer, who applies to them one of two general types of discharges, known respectively as the "tin discharge" and the "zinc dust discharge," both of which are used extensively for the several classes of work for which they are adapted.

THE TIN DISCHARGE.

This is used to some extent for the printing of white figures upon a colored ground, but more generally as a colored discharge, on account of the ease of compounding with suitable colors, and the safety in use. The white discharge is compounded in the following manner:

Acetate of tin, 18° Tw.	60	parts
Wheat starch	18	parts
White dextrine	24	parts
Citric acid	3½	parts
Tin crystals	36	parts
Sodium acetate	9	parts

The acetate of tin used should always be fresh, or at least not over two days old.

This discharge when printed and short steamed at low pressure gives upon suitable grounds, very clear and sharp whites, and is the most satisfactory white discharge in use.

Another printing paste that gives equally good results, but which is preferred in cases where fine tracery is engraved on the shells is as follows:

Wheat starch	13	parts
Water	38	parts
Tragacanth paste (65:1000)	17	parts
Citric acid	2	parts

Boil together until quite smooth, and before cooling off, add:

Tin crystals	24	parts

and when cold, add

Sodium acetate	6	parts

It is usual to have a diluting paste made up and ready for constant use. The proportions for such are:

Wheat starch	10	parts
Tragacanth paste (65:1000)	20	parts
Water	6½	parts
Acetic acid 8° Tw.	5	parts

These are made into a cream while cold, and then boiled well together. No paste or printing color should be delivered to the printer unless it has been thoroughly strained through a haircloth sieve.

For printing contrasting colors, the white discharge is modified in such a way as to carry with it some suitable basic color, as in the following list, none of which are acted upon by the tin discharge:

Safrannies.
Rhodamines.
Methyl violets.
Brilliant green.
Malachite green.

Methylene blues.
Phosphines.
Thioflavine T, or its natural substitute.
Weld (or carmine of weld).

These colors are incorporated in the following manner:

COLORED DISCHARGE PASTE.

Basic dyestuffs (above list) ..... 3 to 6 parts
dissolved in
Water ..... 8 parts
then add
Acetic acid ..... 8 parts
and
Acetin ..... 4 parts
Stir well, and then add with further stirring:
Tragacanth paste (1:1) ... 10 parts
and
White discharge ..... 50 parts
When well incorporated, add:
Tannic acid ..... 10 parts
Tartaric acid ..... 2 parts
Water ..... 90 parts

Print, steam and pass through a bath containing tartar emetic heated to 100° F. so as to fix the basic dye, and prevent bleeding.

The fixing is followed by a thorough washing of the goods, when they are dried and sent to the finishing room.

The zinc dust discharge is a low cost discharge, and upon many ground colors yields very good whites, but it is unavailable for colored discharge work. It is made as wanted by the following processes:

Zinc dust ..... 2 parts
Dextrine ..... 1½ parts
Water ..... 1½ parts
Hyposulphite of soda solution 38° Be. ..... ⅝ part

Another recipe:

Zinc dust ..... 1½ parts
Tragacanth paste (1:1) ... 2 parts
Aqua ammonia ..... ⅓ part
Hyposulphite solution .... ⅝ part

These discharges are made cold, and must be well ground in a mill, and to such an extent that no grit is noticed. When printed, they are steamed for one-half hour, washed in acidulated water, and afterwards in clear water.

The chief objection to the zinc dust discharge is that of roller clogging, which causes much trouble in the print shop.

Pile fabrics can stand considerable treatment, and as a consequence many pleasing effects are to be obtained, one of the most interesting combinations of processes is to dye the ground, then discharge the pattern white, and redye with a contrasting color. Another process is to dye a ground with two colors, one of which will not discharge. Then print the white discharges, steam, wash and finish.

Most useful effects are obtained upon cotton corduroys, specially in the range of dark drabs, dark greens, dark slates, and stone colors. When discharge printed with light shades of the ground color, the combination is very pleasing.

Solutions of bleaching powder (or chlorinated soda) have been used and are gaining in favor for the production of "spatter effects" of velvets, corduroys, etc., that have been dyed with the sulphur colors—a group of dyes that do not well discharge with the ordinary discharge agents. Drabs, greys, blacks, browns, and combinations, produced with Autogene Black, Cachou de Laval, Thiocatechins, etc., and spattered by means of a pneumatic spray with the chlorine solution above mentioned, produce very novel effects. The machinery is simple, while the results are always positive.

The solution must be very dilute, and as it passes over the spray board, it is led over a series of driers, where the maximum discharge is secured. The goods are then washed and finished.

The object of direct color printing on the white goods differs in no way from ordinary calico printing. The colors are the same, and all the subsequent operations follow in order with the exception of the "waxing," an operation whereby a rather good lustre is imparted to the pile of the cloth, and which would otherwise be quite flat and lifeless in appearance.

SULPHUR BLACKS IN COTTON WARP DYEING.

This special branch of cotton dyeing has made rapid strides towards greater excellence in results during the past five years than at any previous period, for the reason that with newer methods of dyeing, due to the introduction of greatly improved coloring matters an incentive was offered for improvements in existing machines. In many mills today where sulphur blacks are in use, the old form of warp dyeing machine is still in evidence, due, without doubt, to existing ideas that what was good enough for older dyestuffs should be equally well adapted to the new products.

There can be no question regarding the great improvement of the quality of blacks as dyed upon warps with the sulphur colors in comparison with aniline oil or salt black. At one time there existed, and justly, great opposition to the use of the sulphur blacks on account of the many complaints, more imaginary than real, regarding the destructive action of the dye, etc., upon the fibre, which happily has been exploded by the researches of various investigators.

Other complaints that existed in the early days, and which even appear now from dyers who are adopting the new blacks, were based upon an idea that the shades produced were thin and without any body. These complaints which accumulated to such an extent as to become really formidable, were found to be wholly due to the use of too little color in the dyebath in proportion to the amount of warp to be dyed. When greater quantities of color were remedied by adding more, the dyer would be dumbfounded by the cost of the kettle, so that, on the whole, the introduction of the new blacks for warps was not by any means a path of roses.

The objections had to be fought at every detail. The tinctorial weakness of this class of products had to be dwelt upon at considerable length, while the tendering of the warps had to be traced very carefully to its source and strict comparisons made with similar results obtained with aniline.

Today, on the other hand, there is hardly a warp dyer of any prominence but who is either using the sulphur blacks or who would use them if he were not equipped with an extensive aniline dyeing plant. Of course, where a man has been brought up as a dyer of one type of goods, and has worked at it for many years, especially with a process like the aniline black process, it is hard to make a change, but as time goes on, the marked advantage of the sulphur blacks over the aniline process will be more fully realized, and then this historical process will be relegated to the past.

Briefly, the important advantages for warp dyeing of the sulphur blacks over aniline are: no tendering of the threads, nor destruction of the fibre in any way; generally less washing to produce equally clean results; no crocking or bleeding into whites.

The question of cost cannot be settled as it is a purely local factor, and depends upon the quantity of material dyed per day, saving on the part of sulphur blacks due to stronger fibres, etc. It may be regarded, however, that all things equal, the two blacks of equal shade will cost approximately the same.

EQUIPMENT FOR DYEING SULPHUR BLACKS

Any installation for warp dyeing may be made to answer, the only points that demand attention are absence of copper or bronze fittings in the dye vessels, plenty of steam for boiling, and washing facilities with ample water. With these at hand, the dyer is ready for work. If a small open warp machine is the only apparatus, it may be used by passing the warps through two to four times at the boil, squeezing after each end, and then washing by a passage through fresh running water.

If the warp is to be after-treated, it is given one passage through a wash water into which a solution of bichromate of potash and acetic acid is allowed to flow. This is better than making two additions, one at each end, where invariably one end (the first end receiving the most chrome), shows a considerable difference in shade from the other.

Where a warp machine of any kind does not exist, an ordinary open kettle provided with a winch may be used. The chain warps are immersed at a boil exactly as yarn, given a few turns over the winch, and then im-

mersed for three-quarters of an hour or so without steam. The washing is done in a separate tub; of course, only short warps could be successfully handled in this way.

The ideal warp machine is the three or four compartment kettle, three dye compartments communicating, and one (separate) washing compartment, each separated by means of squeeze rollers. Such a machine should have the top row of rollers a few inches below the level of the dye liquor. Such a machine is "direct continuous," in that the warps pass completely through the liquor from end to end; a slight modification of it may be termed an "intermittent" dyeing machine, being provided with one or two compartments wherein the warps lie during the dyeing—in other words, the entire warp is completely submerged in the entire volume of dye liquor, excepting the short portion that is at the moment, being washed. Such a machine would require about 1 1/2 gallons of water for each 1 pound of warp.

Reamed warps are not dyed in this country, and only in a very few mills in Europe. While the principle is very good, there are at present a few difficulties that have not been overcome, two of the most important being the tendency to uneven shades and lack of thorough penetration. While small warps may be dyed by this process, it is doubtful whether many of the huge beams seen in our American mills will ever be so dyed.

The best results in warp dyeing with sulphur blacks will always be obtained by working with a boiling bath and keeping the bath alkaline. Where the dye used is soluble in water with or without the assistance of sodium sulphide, it will always be necessary to have present caustic or carbonated alkali in such quantity to maintain the proper degree of alkalinity. Dyeing progresses regularly at the boil or within one or two degrees, consequently the minimum time for dyeing can best be estimated at that temperature. For most blacks when dyed on yarn, one hour will be found necessary, but for warps, the modification of the conditions demand that the same results are to be obtained from a much shorter immersion, this is accomplished by using a much greater concentration of liquor, a proportionately greater amount of salt, and lapping or folding the warps in basket trucks or boxes so that they shall remain hot as long as possible after each run.

Washing after dyeing should be thorough, the alkalies of the dye bath must be removed, and the excess of dye liquor at the same time removed. The old complaints as to the sulphur blacks were invariably due to an excess of salt in the dye bath, thereby partially precipitating the color, and to imperfect washing. By better washing the excess of color is thoroughly removed, and, of course, all tendency to bleed or crock removed. It is now well recognized that where these defects in dyed material are noticed, the trouble can, to a certainty, be traced to this cause and not to the dyestuffs.

A curious case, confirming the above, came under the writer's notice recently, where a red and black check was made with sulphur black dyed warps and filling dyed with the same dyestuff, and woven with para red warp and filling. Upon washing the finished fabric with weak soap, the color appeared to have bled from the black warp, and upon examining the unused portions of both, the warp—due to imperfect washing—was the cause. As a matter of fact, the bleeding was very slight but was sufficient to warrant the pieces being given a thorough soaping.

An important point to observe in connection with the sulphur blacks is that they should not be allowed to dry until the washing is complete, for it is almost impossible to rewash warps or yarn that have once become dry.

New Color Cards.

Azo Wool Blue; Cassella Color Co., 182 Front St., New York City.

Two samples of woolen cloth with silk effect threads and two samples of cotton showing discharge patterns of coloring with Azo Wool Blue C.

Immedial Indone; Cassella Color Co., 182 Front St., New York City.

Twenty-seven shades dyed with Immedial Indone B and 3B on cotton and linen yarn and cloth.

Eboli Blue; C. Bischoff & Co., 88 Park Place, New York City.

Four samples of cotton yarn, two of raw cotton and two of cotton piece goods dyed with different percentages of Eboli Blue 3R and 2B.

Immedial Black; Cassella Color Co., 182 Front St., New York City.

Immedial Black on cotton piece goods containing silk striping threads of different colors.

Gentlemen's Suitings; Cassella Color Co., 182 Front St., New York City.

Fifteen samples of worsted piece goods dyed various shades with black, blue and brown, and having cotton effect threads in white, red and blue.

Immedial Black NBB; Cassella Color Co., 182 Front St., New York City.

Three samples of cotton yarn and two of cotton piece goods dyed with different percentages of Immedial Black NBB Conc.

Chrysophenine R; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

This card has one sample of cotton yarn and one of bleached sateen dyed yellow with Chrysophenine R.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

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Recipe No. 17.

Blue on Cotton Yarn.

Immedial Indone 3 B Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Immedial Indone 3 B Conc.
(Cassella Color Co., 182 Front St., New York.)
30 lbs. Sodium Sulphide.
8 lbs. Soda Ash.
16 lbs. Glucose.
20 lbs. Common Salt

using about two gallons of water for every pound of yarn dyed.

It is best to dye on bent iron rods for one hour at about 120° F. then to squeeze well, and to level by wringing rapidly. For the production of even shades it is essential to squeeze carefully, and wring evenly. After dyeing the yarn is allowed to hang in the air ½ to 1 hour.

For subsequent lots, if the same bath is used, it is only necessary to strengthen the bath with the following additions

8 lbs. 6½ oz. Immedial Indone 3 B Conc.
17 lbs. Sodium Sulphide Crystals.
2 lbs. Soda Ash.
6 lbs. Glucose.

Immedial Indone 3 B Conc. is extremely fast to light, washing, warping, crocking, and cross dyeing.

Recipe No. 18.

Black on Worsted Yarn.

Era Black M on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Era Black M.
(Thomas Leyland & Co., 53 India St., Boston.)
10 lbs. Glauber's Salt.
5 to 10. lbs. Acetic Acid.

Enter yarn at 120° F. and bring to the boil After ¾ hour boiling add

1 to 2 lbs. of Sulphuric Acid

and boil 1/2 hour longer or until the bath is exhausted.

Then after treat in the same bath with

1½ to 2 lbs. of Potassium Bichromate

for ½ hour at the boil. Wash well.

Era Back M produces excellent shades of black, possessing excellent fastness to light, milling, perspiration, acids, alkalies and steaming. It is especially suitable for dyeing loose wool, slubbing yarns, piece goods and felt hats.

Recipe No. 19.

Blue on Woolen Yarn.

Marinol Blue D on 100 lbs. of woolen yarn. Prepare the dye bath with

2 lbs. Marinol Blue D.
4 lbs. Sulphuric Acid.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York City.)
10 lbs. Glauber's Salts.

Enter yarn at 140° F., give two turns, put on steam and bring slowly to a boil. Boil for one hour, lift, wash and dry.

Marinol Blue D may be applied to loose wool, slubbing, yarn or piece goods. It is fast to light, milling and rubbing and possesses all the good qualities of the mordant colors.

Recipe No. 20.

Black on Cotton and Wool Union Goods.

Colonial Black on 100 lbs. union goods. Prepare the dye bath with

5 lbs. Colonial Black.
(F. E. Atteaux & Co., 176 Purchase St., Boston.)
15 lbs. Glauber's Salt.
15 lbs. Common Salt.

Enter the previously wet out goods cold, bring bath very slowly to boil. Boil 45 minutes, remove heat and work 30 minutes longer while bath is cooling.

Colonial Black is an excellent union color, but works equally well on all cotton material.

Recipe No. 21.

Red on Cotton Yarn.

Triazol Red 10 B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Triazol Red 10 B.
(Geisenheimer & Co., 189 Front St., New York.)
2 lbs. Soda Ash.
20 lbs. Glauber's Salt.

Enter at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Triazol Red 10 B dyes evenly and gives an excellent Claret Red shade. It is of low cost and faster than Benzopurpurin.

Recipe No. 22.

Yellow on Woolen Yarn.

Indian Yellow J on 100 lbs. of woolen yarn. Prepare the dye bath with

1 lb. Indian Yellow J.
10 lbs. Glauber's Salt.
(Read, Holliday & sons, Ltd., 7 Platt St., New York.)
3 lbs. D O V.

Enter cold, raise to a boil in half an hour, and boil half an hour.

Indian Yellow J gives equally good results on silk, jute or paper. It possesses excellent leveling qualities and its resistance to light, alkalies, and acids is very good.

Recipe No. 23.

Bordeaux Red on Cotton Yarn.

Toluylene Bordeaux B on 100 lbs. cotton yarn. Pre pare the dye bath with

3 lbs. Toluylene Bordeaux B.
(Geisenheimer & Co., 189 Front St., New York.)
50 lbs. Glauber's Salt.

Boil up the dye bath, enter yarn and dye at a boil for one hour.

Toluylene Bordeaux B gives excellent shades of bluish red, which possess very good fastness for a direct cotton color.

Recipe No. 24.

Yellow on Worsted Yarn.

Anthracene Yellow C on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Anthracene Yellow C.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
20 lbs. Glauber's Salt.
2 lbs. Acetic Acid.

Enter yarn cold, bring slowly to a boil and dye at a boil for about one hour, and if necessary add a little more Acetic Acid to exhaust the bath.

Allow bath to cool to 160° F., add

1 lb. Potassium Dichromate,

bring to a boil and after treat at a boil for another half hour.

Anthracene Yellow C dyes easily level, and is very fast to milling and light.

Recipe No. 25.

Reddish Violet on Worsted Yarn.

Fast Acid Violet R B E on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Fast Acid Violet R B E.
(Herman O. Metz & Co., 122 Hudson St., New York.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 170° F., and dye at a boil for one hour, exhausting the dye bath if possible.

Fast Acid Violet R B E possesses high coloring power, dyes evenly and exhausts well. It withstands the oxidizing action of potassium bichromate very well and possesses good fastness to light, it is therefore valuable in the shading of chrome colors.

Recipe No. 26.

Brown on Cotton Yarn.

Katigen Brown 2 R on 100 lbs. cotton yarn. Pre pare the dye bath with

20 lbs. Katigen Brown 2 R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
20 lbs. Sodium Sulphide.
6 lbs. Soda Ash.
50 lbs. Glauber's Salt.

Add to the dye bath the required quantity of soda ash and glauber's salt, boil up and then add color, which has been previously dissolved in the sodium sulphide. Boil up again, turn off steam and dye for 3/4 to 1 hour just below the boil.

As soon as the material is taken from the bath it should be well rinsed in a bath containing a little acetic acid, which neutralizes any remaining alkali, and thus prevents yellow streaks.

The color may be rendered faster by an after treatment with

3 lbs. Potassium Bichromate.
3 lbs. Copper Sulphate.
5 lbs. Acetic Acid.

Katigen Brown 2 R gives a fine reddish cutch and maroon shade, and is particularly recommended for the shading of other Katigen colors.

Recipe No. 27.

Green on Worsted Yarn.

Guinea Green B Extra on 100 lbs. of worsted yarn. Prepare the dye bath with

3 lbs. Guinea Green B Extra.
(Berlin Aniline Works, 213, 215 Water St., New York.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 170° F. and dye at a boil for one hour, exhausting the dye bath if possible.

Guinea Green B Extra, possesses high coloring power, dyes evenly, and is an excellent color for acid wool dyeing both as a self color and for compound shades.

Recipe No. 28.

Slate on Cotton Yarn.

Pyrol Black O Extra on 100 lbs. of cotton yarn. Prepare the dye bath with

1 lb. Pyrol Black O Extra
(C. Bischoff & Co., 88 Park Pl., New York.)

previously dissolved with

4 lbs. of Sodium Sulphide

and

5 lbs. Soda Ash
40 lbs. Common Salt.

Boil up the bath, reduce heat, enter yarn, and dye just below the boil for one hour, keeping material below the surface of the liquor.

Pyrol Black O Extra, produces excellent and fast slate colors with a low percentage of dyestuff.

Recipe No. 29.

Yellow on Worsted Yarn.

Chrome Yellow R on 100 lbs. of worsted yarn. Prepare the dye bath with

3 lbs. Chrome Yellow R.
(Sykes & Street, 85 Water St., New York.)
3 lbs. Acetic Acid.
1½ lbs. Potassium Bichromate.

Enter the previously well cleansed yarn without previous mordanting and dye at a boil until the bath is exhausted, then continue the boiling twenty minutes to insure complete fixation.

Chrome Yellow R gives a rich and fast shade of yellow. The great advantages of this dyestuff are the obtaining of fast shades without any previous mordanting or separate after treatment, and that direct additions may be made to the bath without cooling it.

Recipe No. 30.

Blue on Tannin Mordanted Cotton Yarn.

Rhoduline Blue G G Extra on 100 lbs. of cotton yarn.

First mordant the yarn in a tannin bath made up with

4 lbs. of Tannin.

Work in this bath for 1/2 hour at a temperature of 180°, and then allow to steep in cooling bath a few hours or over night.

Then work in a cold bath, made up with

2 lbs. of Tartar Emetic

for 1/2 hour, then rinse well and dye in a bath made up with

2 lbs. Rhoduline Blue G G Extra
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York)

and

3 lbs. Alum

for 1/2 to 3/4 of an hour at a temperature of 140° to 150°.

Rhoduline Blue G G Extra is excellently suited to the printing of cotton cloth.

Recipe No. 31.

Black on Cotton Yarn.

Pyrol Black O Extra on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Pyrol Black O Extra
(C. Bischoff & Co., 88 Park Pl., New York,)

previously dissolved with

25 lbs. Sodium Sulphide,

and

10 lbs. Soda Ash
70 lbs. Common Salt.

Boil up the bath, reduce heat, enter goods and dye just below the boil for one hour, keeping material below the surface of the liquor.

Pyrol Black O Extra posseses high coloring power, and the fastness to light and washing characteristic of the sulphur colors.

Note.—Its high coloring power will be noted from the fact that only 10% of dye stuff gives a very good black. A little more dve stuff, say an addition of 2%, will give an extremely deep and rich black.

Recipe No. 32.

Brown on Worsted Yarn.

Chrome Brown S on 100 lbs. of worsted yarn. Prepare the bath with

3 lbs. Chrome Brown S.
(Sykes & Street, 85 Water St., New York.)
3 lbs. Acetic Acid.
1½ lbs. Potassium Bichromate.

Enter the previously well cleansed yarn and dye at a boil until the bath is exhausted which will take about one hour, and then continue the boiling twenty minutes to insure complete fixation of the color.

Chrome Brown S gives a very bright and fast shade of brown. The great advantages of this dye stuff are the obtaining of fast shades without any previous mordanting or separate after treatment, and that direct additions may be made to the dye bath without cooling it.

Mill News.

COTTON.

New Mills.

Maryland, Baltimore. The William J. Hooper Manufacturing Company has purchased site and will soon let contracts for erection of a large plant for making seine twines, nettings and other kinds of cordage.

*Massachusetts, Holyoke. The Bullard Thread Co., recently incorporated with capital stock of $20,000 and succeeding the Cressy Thread Co., will make thread, 36 to 140. Azro A. Coburn is president of the company; W. H. Bullard, treasurer and agent. Sell direct.

*Massachusetts, South Hadley Falls. The warps and looms are being installed in the Hadley Mills this week and it will not be long before the entire plant is running. Operations have been going on in the pattern room for some time.

*North Carolina, Greensboro. The new company in which W. I. Young has been reported interested is to be known as Etowah Mills. Plant will be equipped with 15,000 spindles and 450 looms, also dye house. The company is capitalized at $1,000,000.

*North Carolina, Marshall. The Capitola Manufacturing Company will start work early this week on erection of a new mill which they expect to have completed about September. The company is capitalized at $300,000, with W. J. McLendon, Jr., president, and E. N. Clemens, treasurer. Plans are for 30,000 spindles and 500 looms, although the first installment will consist of but 15,000 spindles with 500 looms. They will manufacture 4 to 6 yard sheetings with intention to change to colored goods later. Plant will be equipped with a dye house, operated by water power.

*North Carolina, Spray. The Rhode Island Cotton Manufacturing Company will soon start operations in their new mill to manufacture yarns No. 30s. This is the plant of which L. McRay is superintendent.

*North Carolina, Weldon. The Chockoyotte Mfg. Co., capitalized at $90,000, is a new concern in which J. T. Evans and J. Bradbury are interested. They propose manufacturing cotton yarns, etc., and they have under consideration a building formerly used as a wire factory. When the necessary capital is all secured, a plant of about 5,000 spindles will be put in. They will also have a dye house and will use either water or electric power. It is proposed having the mill running by the next crop of cotton.

Pennsylvania, Philadelphia. Thomas Spence has just started up in the beaming of plain, colors and fancies with one frame on Penn street, above Unity, and reports business good.

Rhode Island, Pawtucket. The Columbia Braiding Company has been incorporated with a capital stock of $50,000 for the purpose of manufacturing braiding machines and also to manufacture braid. Adams Sutcliffe and John P. Swift and James L. Jenks are interested.

Rhode Island, Providence. The Providence Braid Company has been incorporated with a capital stock of $50,000 by Edward C. Chapman, Robert L. Ward and George S. Cooper of this place. They will manufacture yarns, lacings and braids.

Rhode Island, Providence. The Standard Braid Company has recently been organized with capital stock of $75,000, by Rufus B. Goff, Charles S. Davol and Arthur W. Dennis.

*Rhode Island, Providence. The International Webbing Co., recently reported incorporated with capital stock of $15,000, will start operations about February 20th, making elastic and non-elastic, silk and cotton webbing. C. P. Godfrey is president of the company; G. M. Thurlow, treasurer and C. E. Godfrey, superintendent. Plant will be equipped with 24 looms and operated by electric power. Will sell direct and on commission.

*South Carolina, Liberty. The organization of the Calumet Manufacturing Company has been perfected. H. L. Clayton is president of the company in which O. A. Robbins of Charlotte, N. C., is also interested. Fine yarns from long staple cotton will be made.

*Virginia, Emporia. A new plant is under construction for the Emporia Cotton Mill, recently reported incorporated with capital stock of $100,000. W. Samuel Goodwyn is president of the company and Thomas W. Brown, treasurer. They expect to start operation about June, 1904, operating 4,500 ring spindles.

Enlargements and Improvements.

Connecticut, Ballouville. The Attawaugan Company is installing six new filling frames, also new speeders in the card room of the Ballou Mills.

Connecticut, Baltic. At meeting held recently by the directors of the Baltic Mills, it was voted to increase the capital stock by issuing 4,000 shares of the par value ($100 each), making the amount of capital stock $1,000,000.

Georgia, Eatonton. The Eatonton Electric Cotton Mills are reported making preparations to build an addition to the plant.

*Georgia, Thomaston. Work is progressing on the addition to the Thomaston Cotton Mills. They will install new machinery in same when completed.

*Kentucky, Louisville. The Louisville Cotton Mills Co., recently reported having increased their capital stock, expect to have additional machinery in operation by February 1st, 1904. The plant will then have an equipment of 9,408 mule spindles and 11,440 ring spindles on combed peeler, mule spun yarn on cones.

Kentucky, Louisville. The stockholders of the Louisville Cotton Mill Company have authorized the issue of new stock to the value of $100,000 ($125 a share) to be subscribed by February 1 1904.

*Maryland, Elkton. Deibert & Wilson have started work on rebuilding part of the plant recently destroyed by fire.

Massachusetts, Bondsville. The Boston Duck Co. is adding eight more new looms to the plant.

*Massachusetts, No. Adams. The Arnold Print Works have about two-thirds of the spinning and preparatory departments of the large new weave shed in operation.

*Massachusetts, North Attleboro. The Royal Textile Company is adding a large number of machines to the plant recently removed here. Operations will soon be started.

Massachusetts, Westfield. The Planet Manufacturing Co. and the Columbia Thread Co. are to be consolidated under the name of the Planet Manufacturing Co., with A. M. Schappa, manager. These concerns have been located in the same building.

New Hampshire, Manchester. The Manchester Mills are to replace another 100 of the old looms with new ones.

New Hampshire, Nashua. The Jackson Cotton Mills have completed installation of 23 new carding machines.

*North Carolina, Albemarle. The Efird Mfg. Co. has begun installation of the machinery (5,000 spindles) in plant to be known as Mill No. 2.

North Carolina, Gibsonville. The machinery of the Hucomuga Mill at Greensboro is to be added to the equipment of the Mineola Mills, the capacity of which will be increased five times the present size. Clarence N. Cone is in charge of the plant and J. H. Denney, superintendent of the Hucomuga mills, holds same position with the Mineola mills.

*North Carolina, Ramseur. The Columbia Mfg. Co. has completed one story addition to the plant, 50 by 88 feet. They have installed new dyeing machine and engine and dynamo in same. The general capacity of the plant remains the same, only change being in class of goods made.

Pennsylvania, Philadelphia. Herbert B. Newton, manufacturing upholstery goods, 139 Oxford St., will remove the plant to Kensington Ave. and Venango Sts. about February 1st. There will be better facilities in the new location.

Pennsylvania, Pottsville. W. F. Scheerer & Son, manufacturers of ladies' cotton underwear at 1020 Race Street, report being very busy and will probably increase capacity of the plant in a very short time.

Rhode Island, Drownville. The Interlaken Mills, of Arkwright, have purchased the Annawamscutt Mills and will operate same on book cloths.

Rhode Island, Warren. The Warren Manufacturing Company is to erect an addition to the mill and work will soon be started on same.

*South Carolina, Anderson. The Brogan Mills, capitalized at $1,000,000 ($600,000 paid in), expect to have their new mill in operation about April 1st, 1904, with an equipment of 25,000 ring spindles and 1,050 looms, manufacturing outing flannels, domets, and teasles and downs.

South Carolina, Chester. The Wiley Cotton Mills Company is completing installation of 5,000 additional spinning and other machinery in the mill.

*South Carolina, Clinton. The Lydia Cotton Mills are now installing the additional machinery reported last June to be added. The new buildings erected give an increased floor space of 80,000 square feet and will accommodate 7,500 more spindles and 480 looms should conditions warrant a further increase.

*South Carolina, Fairmont. The Tyger Cotton Mills were erroneously reported to increase their number of spindles.

South Carolina, Glendale. Five hundred and fifty new Draper looms have recently been started up in the Glendale Cotton Mill. The capacity and equipment of this plant has otherwise been improved and enlarged.

*South Carolina, Inman. Operations have been resumed in the Inman Mills, closed recently for purpose of installing additional machinery in the addition built for the purpose.

South Carolina, Newbury. Additional carding and picking machinery has been installed in the Newberry Cotton Mills. Other improvements are also being made which will greatly increase the capacity of the plant.

Tennessee, Humbolt. The Humbolt Cotton Mills have voted to increase the capital stock for the purpose of doubling the present equipment. Contracts will be placed at an early date for building and machinery.

*Tennessee, Nashville. It is reported that the Tennessee Mills Company, which recently increased the capital stock to nearly $200,000 for the purpose of purchasing new machinery, contemplate selling the present plant, and if effected will erect a new building.

Mills Starting Up.

Massachusetts, Hampton. The Hampton Mills Company's plant is being started up by James Graney.

Mississippi, Moorhead. The Moorhead Cotton Mills have resumed operations after a long idleness.

*North Carolina, Charlotte. Operations will start about the first of February by the Continental Manufacturing Company, which purchased the old Victor Cotton Mills. Geo. E. Wilson is president of the concern and A. C. Hutchinson, secretary and treasurer.

*North Carolina, Lincolnton. The Wampum Mill has started operations in the new mill, equipped with 10,000 spindles.

*Rhode Island, Valley Falls. The Naushon Cotton Mills have resumed operations.

*South Carolina, Greers. Operations will be started early in January in the new plant of the Apalachee Cotton Mills Co.

WOOLEN.

New Mills.

*Massachusetts, Hyde Park. The Fairmount Wool Scouring & Mfg. Co., recently reported incorporated at Kittery, Me., with capital stock of $10,000, will be located at this place. John W.

Linnehan is treasurer and general manager of the plant. The old Wilton wool scouring mill, Hyde Park Ave., will be equipped with new machinery. They will manufacture wool extract and shoddies and also make a specialty of custom carding. Will install two washers, carbonizing plant, four pickers, two scourers, two dryers (6,000 lbs. capacity and one 8,000 lbs.), for which order has been placed.

*North Carolina, Spray. Operations will begin shortly by the Spray Woolen Mills Company.

Pennsylvania, Philadelphia. The Sanitary Manufacturing Company has been incorporated with a capital of $20,000 and the following officers: John Greer, president, and M. H. Greer, secretary and treasurer. They manufacture art squares and rugs on five looms, which they intend to increase at once 50 per cent. John Greer is the superintendent. The goods are sold direct. Plant is located in the buildings at the northwest corner of Mascher and Oxford streets.

Pennsylvania, Philadelphia. Mr. John R. Smith, lately from down east, and Harry Smith, at one time fixer at Thomas Dolan's mill and then with Philip Doerr & Son, Philadelphia, have started a business for the manufacture of ingrain carpets on Mascher street, below Lehigh avenue, in the mill occupied by R. H. Shaen. They have many orders on hand and are now getting out their samples, which will be submitted to the trade in a short time. The business is run under the name of Smith Bros., and they operate six looms and one winder.

Pennsylvania, Philadelphia. William Ellison & Son, manufacturers of worsted dress goods on 400 looms in Bradford, England, are about to start a branch mill in this city. Mr. Ellison, who has been in Philadelphia for some time looking for a suitable building, has just signed a lease for a term of years for the building formerly occupied by the late W. P. Troth, Jr., & Co., 4315 Franklin street. Mr. Ellison, having completed arrangements for the starting of the plant, has now sailed for England and upon his arrival will at once send his manager to this country to superintend the placing of the machinery in position, all of which, it is said, will come from abroad. It is expected that at least part of the machinery will be in operation by March 1st next.

*Rhode Island, Woonsocket. Montgomery Rollins is president of the Scotia Worsted Mills, which was recently organized to operate the Simson and Kirkaldy Mill; A. Howard Hopping is vice-president; James D. Colt, treasurer, and David W. Shirreffs superintendent and agent. This company is capitalized at $90,000.

Enlargements and Improvements.

Kansas, Oakland. The Topeka Woolen Mills Company has been granted charter with capital stock of $100,000. This is an increase from $37,000.

*Maine, Oxford. The Robinson Mfg. Co. has completed erection of a new boiler house in which two large boilers have been installed.

Maine, Springvale. The Maine Alpaca Mill will make various improvements to the plant, including installation of two new water wheels.

Maine, Springvale. Work is nearing completion on a new store house, 200 by 36 feet, one story and basement, for the Marston Woolen Mill.

Manitoba, Brandon. The Brandon Woolen Mills have recently completed installation of plant for making yarns and blankets.

*Massachusetts, Conway. A new boiler is being installed in the woolen mills at this place.

*Massachusetts, Holyoke. The Holyoke Plush Co. has started operations in the newly remodelled mill.

Massachusetts, Methuen. A dye house has been installed in the Tremont Worsted Co.'s plant, for purpose of doing its own dyeing.

Massachusetts, Pittsfield. The J. L. and T. D. Peck Manufacturing Company has issued bonds of $300,000 for the purpose of enlarging the plant and replacing old machinery in several of the departments with new. This concern now disposes of a greater part of the goods to the consumers.

*Massachusetts, Pittsfield. Plans are being made for extensive alterations to be made to the Hellihell Manufacturing Co.'s mill. It is stated that if present plans are carried out, the company will manufacture fancy worsteds, which will necessitate erection of an additional building.

Massachusetts, Webster. An additional building, 90 by 70 feet, two stories, is to be erected by Eben S. Stevens. It is proposed to use the new addition for spooling, beaming and dressing warps for the mill here and the one at Quinebaug, Conn.

New Hampshire, Rochester. The Rochester Woolen Company is to install eight new looms in the plant.

New York, Albany. F. C. Huyck & Sons have recently completed installation of three new German looms in their mill. Eight more will be added.

Pennsylvania, Lenni. The plush mills of the Daniel Lees' estate are running to their full capacity. They have recently added ten new looms.

Rhode Island, Providence. The Standard Worsted Mills operating a plant at this place have been incorporated with capital stock of $25,000. Shepard I. Raymond is president; Henry J. Bailey, treasurer; Emma E. Bailey, secretary, and Walter F. Slade, superintendent. This concern is operating 24 looms on woolen and worsted goods and will also operate 21 looms at the Oak Valley Mills, Burrillville.

Rhode Island, Washington. The Livingston Woolen Mill is making extensive alterations to the plant. The spoolers and skein winders and twisting machines have been removed to upper floors and the space vacated will be filled with 20 looms from the Coventry Mill thus putting all the looms in the same building. It is reported that the Coventry plant will be used as a yarn mill.

*Tennessee, Chattanooga. The Extract Wool & Merino Co. has completed work on their new mill, 100 by 200 feet, three stories. A new two-story boiler and engine room for a steam plant of 225 horse power has also been completed. They will remove the old plant to new building early this month.

Vermont, Springfield. W. H. H. Slack & Bro. have recently increased their carbonizing capacity by the addition of a building 40 by 200 feet and

have added three more pickers in their shoddy plant. They are now operating seventeen pickers.

Washington, Kirkland. The Seattle Woolen Mills Company is to enlarge the plant and have under construction an addition for a pullery.

Mills Starting Up.

*Massachusetts, Medway. The Medway Woolen Company has been incorporated with a capital stock of $15,000 to operate the plant of the Senior & Singleton Company. Fred R. Smith (Danielson, Conn.) is president of the company and Frank C. Smith (Worcester) treasurer. Operations have been resumed in the mill.

*Pennsylvania, Aston Mills. The May Manufacturing Company has resumed operations after a shut down during the recent holidays.

Mills Shutting Down.

Maine, Gardiner. The Cobbosseecontee Woolen Company's mill has been shut down for an indefinite time, reason assigned owing to the shortage of stock.

Maine, North Shapleigh. The Hargraves Woolen Mills have shut down. A notice was recently posted in the mill of a ten per cent. cut down, which the employees refused to accept.

Maine, North Vassalboro. The Vassalboro Woolen Mills (of the American Woolen Company) have been closed for an indefinite time owing to the low water in China Lake. During the shut down extensive and necessary repairs will be made on the plant.

*Massachusetts, West Rutland. The Lakeville Woolen Company, which recently filed a petition in voluntary bankruptcy, has been granted a discharge and work has been resumed in the mill.

Oregon, Pendleton. The Pendleton Woolen Mills have been closed for the purpose of making general repairs to the plant. It is stated that operations will probably not be resumed until the middle of March or the first of April.

KNIT.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

New Jersey, Midland Park. The Midland Park Silk Company has been incorporated with a capital stock of $25,000. Nicholas Murray is president, William C. Lucas, treasurer, and William Yates, secretary. A silk mill now at this place manufacturing broad and tie silks will be used. Plant is equipped with 32 box and 12 plain looms.

New Jersey, Paterson. J. Hengeveld has leased the silk throwing plant formerly occupied by Post & Sheldon in the Hall mill and will operate same as a commission throwster, under name of the Paterson Silk Throwing Company.

*New York, Chadwick's, The Standard Silk Company, which has acquired the plant formerly known as Chadwick's Cotton Mill, is equipping the same for a throwing plant and expects to start operations early in the year.

*New York, Hamilton. Operations have begun in the silk mill recently established at this place. Work will continue installing machines until 40 have been placed.

*Pennsylvania, Duryea. William Dutton is president of the Dutton Silk Company, recently incorporated with capital stock of $30,000. H. L. Endsall, vice-president, and James Dutton, treasurer. Plans are being made for the erection of a large silk throwing plant. Mr. Dutton's mill at Paterson, N. J., will be removed here.

*Pennsylvania, Mercer. R. R. Wright is president of the Mercer Silk Mills Company recently incorporated with capital stock of $25,000, and Herman Frenkel, treasurer. The stone work on foundations has not been completed, owing to the cold weather, and work on the plant will be pushed in the spring. They will make silks and expect to have the plant in operation during the year.

*Pennsylvania, Scranton. The Ashley Silk Manufacturing Company has been organized with a capital stock of $50,000, by William H. Ashley, Tillie Ashley and John Carr. They will manufacture silk goods on an extensive scale and will employ about 300 in a new mill which they contemplate having ready to start up in about three months. This refers to W. H. Ashley's new silk mill.

Pennsylvania, Wilkesbarre. Wilkesbarre Silk and Embroidery Company will erect a new plant for manufacturing embroidery.

Pennsylvania, Wind Gap. It is reported that the foundation has been put in for a new silk mill, 80 by 56 feet, 2 1/2 stories, which is to be erected. Marsh Bros. of Bangor have contract for the erection of the building. It is stated that about 40 people will be employed at the start of the mill.

Washington, Bellingham. The Washington Silk Company is to be incorporated with capital stock of $100,000. They propose making plain staple fabrics at the start and later necktie goods. Plans are not yet complete regarding the proposed mill. H. Butterworth, 1050 Elk St., is interested in the project.

Enlargements and Improvements.

Pennsylvania, Berwick. Additional machinery is to be installed in the addition recently completed for the Colonial Spinning Mills. The capacity of the plant will be about doubled.

Pennsylvania, Pottsville. Operations have been resumed in all the departments of the Tilt Silk Mill, upon which improvements and repairs have been made since the first of January.

Mills Starting Up.

*Connecticut, Willimantic. Operations have been resumed in A. G. Turner's silk mill after a shut down of several weeks.

*Pennsylvania, Littlestown. The Littlestown Silk Company has started operations with about 25 people.

Mills Shutting Down.

*Pennsylvania, Kutztown. The Berks Silk Throwing Mill will be shut down when the stock on hand is exhausted. It is thought that the plant will be converted into a weaving mill.

MISCELLANEOUS.

New Mills.

Pennsylvania, Philadelphia. Thomas Robb, boss dyer at the Columbia Dye Works, Philadelphia, and C. L. M. Crawford are about to start up in the waterproofing of cotton, woolen and silk fabrics from a new and secret formula owned by Mr. Robb. One five-cylinder dryer has already been set up and they are now looking into the matter of purchasing a folder, the order for which has not been placed. The business will be run under the name of Thomas Robb & Company and their intention is, if this new business meets with success, to add a dyehouse and dye and finish for the trade. They are located at Warnock and Diamond Streets in the Fretz Building.

*Rhode Island, Tiverton. The new dye plant reported started here by Patrick Crosson is located at North Tiverton and is to be operated as Crosson Bros., bleaching and dyeing cotton and linen yarns.

Enlargements and Improvements.

Pennsylvania, Schuylkill Haven. Six years ago Mr. Samuel Rowland started in Schuylkill Haven, Pa., the Schuylkill Haven Bleach and Dye Works, in which he made a specialty of bleaching knit goods. Mr. Rowland is very energetic and active to meet the demands made upon him by the trade and has now installed new spoolers and cone winding machinery which enables him to deliver either bleached or dyed yarns on cones direct to the consumer. He states that the price of cotton acts somewhat as a detriment to him in his business, but this he has overcome by putting out product which is meeting with great approval from the manufacturers and for which he is receiving many orders.

Rhode Island, Ingrahamville. A large addition is under construction to the Ingrahamville Dye Works.

Mills Shutting Down.

*Pennsylvania, Hazelton. The Dunlap Silk Plant has been closed indefinitely owing to trouble with the operatives.

Pennsylvania, Philadelphia. The Providence Mills Co., 55th St. and Girard Avenue are shut down.

FAILURES AND SUSPENSIONS.

New Jersey, Paterson. Siegfried Butts, operating a broad silk plant in the old Adams Mill, has made a general assignment to Joseph Formanns for the benefit of his creditors.

New York, Fonda. A petition in bankruptcy has been filed by Andrew Wilson and Lambert Nelbach operating the Mystic Star Knitting Mills. The liabilities are placed at $10,628.45 (about one-fifth secured), and the assets $13,766.94.

New York, New York. A petition in bankruptcy has been filed against the Riverside Knitting Mills Company by David Oppenheimer, Joseph S. Blank and Benj. Barnett.

FIRES.

Maine, Camden. The dye house of the Knox Woolen Mills was badly damaged by fire. Loss is placed at about $4,000.

Massachusetts, Boston. The Boston Silk Weaving Company, occupying the 5th floor of building at 74 and 78 India St., was slightly damaged by fire which occurred in said building recently.

Massachusetts, Cherry Valley. About $400 worth of damage was done by fire which started in the picker house of Geo. W. Olney's Woolen Co.

Massachusetts, West Millbury. The Ramshorn Woolen Mill operated by Thomas Windle has been damaged by fire, causing loss of about $10,000 on stock and about $35,000 on the building; covered by insurance.

New Hampshire, Tilton. A. D. Carter's Woolen Mill has been damaged to the extent of $1,000, by fire which started in the picking room.

New York, Buffalo. The Buffalo Batting Mills have been damaged by fire. Loss, estimated at about $7,000 on building and contents, is covered by insurance.

Pennsylvania, Duncannon. John G. Martin's Hosiery Mill has been destroyed by fire.

Pennsylvania, Philadelphia. William T. Smith & Son's rug mill has been damaged by fire to the extent of $5000.

Rhode Island, Woonsocket. The Rhode Island Dyeing & Finishing Company's mill has been damaged by explosion of three drying cans in the drying room.

Virginia, Danville. The Riverside Cotton Mills have been damaged by fire, which started in a room in which paper and lubricating oils were kept. Most of the loss, however, was due to water which leaked through on the floors.

FACTS AND GOSSIP.

Alabama, Siluria. The Siluria Cotton Mills Company is reported to duplicate the machinery of the present mill after the plant is in operation.

*Arkansas, Fort Smith. George Sengel is reported interested in agitating the question of cotton mills here.

*Colorado, Denver. The Overland Cotton Mills are stated to be in the bankruptcy court and involuntary bankruptcy proceedings have been started by Fairbanks, Morse & Company, Denver Lithographing Company and others.

Connecticut, Norwalk. A new concern has recently been incorporated as the Eastern Underwear Co. William S. Sturtevant, Leslie Gambit and John Keogh are interested.

*Connecticut, Shelton. S. Blumenthal & Sons, manufacturers of silk velvets, will start up the machinery, which can be adapted, on manufacturing certain kinds of woolen goods. Should conditions warrant, they will again start up the manufacture of velvets.

*Connecticut, Stafford Springs. Herman Rawitser is president of the Fabyan Woolen Co., recently reported incorporated with capital stock of $200,-

000; Chas. H. Meyers, Jr., treasurer, and Chas. H. Meyers, superintendent.

*Connecticut, Staffordville. The Faulkner Mills expect to have the finishing department running by January 1st.

Connecticut, Stonington. The Mystic Woolen Co. has been organized with a capital stock of $50,000. Herman and Simon Rawitser and Sidney Siswich are the incorporators.

Connecticut, Willimantic. At the annual meeting of the stockholders of the Windham Silk Co., held recently, the following officers were elected: Frank Larrabee, president; Charles Fenton, secretary and general manager, and W. P. Jordan, treasurer.

*Connecticut, Windham. The Windham Silk Co. is now operating 90 looms and expect to have more in operation soon.

Georgia, Atlanta. The Georgia Cordage Mills have adopted the American Moistening Company's system of humidifiers.

*Georgia, Fitzgerald. The Garbut Lumber Co. which purchased the Irwin County Mills will not put same in operation before next October.

Georgia, Gainesville. The Gainesville Cotton Mills are making a large extension of their system of humidifiers, installed by the American Moistening Company, Boston, Mass.

Georgia, Rome. T. W. Lipscomb and Wright Willingham have purchased the controlling interest in the Floyd Cotton Mills, held by Hugh T. Inman. It is stated that the new owners will sell their new cotton and not operate the plant until the cotton market is more settled.

Georgia, Senola. It is reported that a project is on foot for erecting a cotton yarn mill and that $25,000 has been secured toward the project.

*Georgia, Warrenton. C. C. Wiliams, recently reported having purchased the property of the Battle Manufacturing Company, advises that he has only purchased land and tenement houses. The mill, which was destroyed by fire two or three years ago, will not be rebuilt.

Idaho, Boise City. It is reported that capital stock has been subscribed and machinery ordered from abroad for a new knitting mill to be started up here about March. Negotiations are under way for securing a good site.

Illinois, Chicago. The Chicago Woolen Mills have been incorporated with capital stock of $25,000. W. D. Schmidt, F. D. and E. A. Schmidt are the incorporators.

Illinois, Chicago. The Meyercord Company have adopted the American Moistening Company's system of humidifiers.

Kansas, Parsons. A cotton mill, costing about $75,000 is projected here. Witten McDonald, interested in mill projected at Mammonth Springs, Ark., is also interested in this project.

Louisiana, New Orleans. N. N. Isenberg of Greenville, Miss., is reported as contemplating establishment of a cotton batting mill here.

*Maine, Abbott Village. We have been advised by the Moosehead Woolen Company that they have not yet decided what they will do concerning the plant recently destroyed by fire.

Maine, Portland. The Belfast Linen Company, Ltd., has been organzied with a capital stock of $1,000,000. A. J. Desmond of Portland is president and Henry L. Cram is treasurer.

Maine, Saco. The Eastern Decorating and Manufacturing Company has been incorporated with capital stock of $10,000 for the purpose of manufacturing tents, flags, bunting, etc. Frank E. Noyes, (Haverhill) is president and treasurer of this concern.

Massachusetts, Byfield. Operations have been discontinued for an indefinite time in room No. 2 of the felt department of the Byfield Woolen Mills.

Massachusetts, Chicopee. The Burtworth Carpet Company is reported as contemplating removing plant to Thompsonville, Conn. The citizens of this place have interested themselves in the question of retaining the mill.

Massachusetts, Fall River. It is reported that there is a general movement on foot for curtailment of production in various mills at this place and that after the first of January plants will be operated three days a week.

Massachusetts, Holyoke. At a meeting held recently by the stockholders of the Holyoke Thread Co., it was decided to make an assignment for the benefit of the creditors. It is understood that the several attachments placed upon the plant will be raised upon the agreement of the company to assign.

*Massachusetts, Holyoke. The Holyoke Thread Company has made an assignment to F. F. Partridge, John Tilley and T. J. Gibson. Statements of the Company's affairs have not yet been given out.

Massachusetts, New Bedford. Securities will soon be issued for the reorganization of the New England Cotton Yarn Company.

*Massachusetts, North Chelmsford. Work is progresing rapidly on the interior work of George C. Moore's new woolen scouring plant.

Massachusetts, Northampton. The Nonotuck Silk Mills are again running on full time.

Massachusetts, Pittsfield. The A. H. Rice's Silk Mills are unusually busy and are working some of the departments until ten o'clock at night.

Massachusetts, Spencer. George Davis and Joseph Wicks of Worcester, have leased the woolen mill hitherto operated by H. C. Leavitt.

Massachusetts, West Stoughton. The French & Ward Woolen Mill has been closed during the present week on account of a break in the machinery.

Massachusetts, Westville. It is reported that a project is under way for organizing a company with capital stock of $60,000 to manufacture cotton yarns. They propose to acquire the Westville Mills, at this place. Henry S. Culver will probably be manager of the plant.

Mississippi, Meridian. J. T. Fyans of Fall River and A. F. Knight, Providence, R. I., are reported interested in erection of a $250,000 cotton mill at this place. Propose incorporating under name of Queen City Mills Co.

*Mississippi, Meridian. The proposed cotton mill at this place is to have an equipment of about

15,000 spindles and 450 looms. If the machinery offered by Mr. A. F. Knight from an New England mill is not accepted they will install an entirely new equipment.

Mississippi, New Albany. It is reported that New York capitalists are interested in establishing a 4,000 spindle cotton mill in the South and that the citizens of this place are making an effort to secure the enterprise. Mr. Schulter, Industrial Commissioner of the 'Frisco System at St. Louis, is also interested.

New York, Lockport. Evans & Company are successors to Norman & Evans, manufacturers of "Golden Fleece" wadding.

Personals.

PERSONALS.

Cotton.

C. N. Taylor has resigned as dyer at the Tremont & Suffolk Mills, Lowell, Mass., which he was in charge of the past 12 years.

George H. Winslow, master mechanic and chief engineer, from North Adams, A. C. Paine, chief clerk, Joseph Lankes, designer, Everett E. Reade, boss weaver, and James H. Boyd in preparatory department, all go with C. W. Dennett, who has been appointed manager of the Glasgow Mill, South Hadley Falls, Mass. Work is being pushed forward as rapidly as possible on repairs and the fixing over of the tenements, and the mill will be started shortly.

John W. Ramsbottom has resigned as superintendent of the Samoset Mills, Valley Falls, R. I., and is the new superintendent at the Brighton Mills, Passaic, N. J.

A. E. Benson, formerly of Central Falls, R. I., has gone to Magnolia, Miss., to start up a mill on leno work, fancies, etc. He will also be designer.

E. M. Lipscomb, president of the Ninety-Six Cotton Mills Co., of Ninety-Six, S. C., tendered his resignation on January 1st. At a meeting of the stockholders and directors recently Capt. Ellison A. Smythe was elected to succeed him.

Justin J. Crane, overseer of the No. 2 mill of the Chicopee Mfg. Co., Chicopee Falls, Mass., has severed his connection with that company.

F. J. McNeely, superintendent of the Fairfield Mfg. Co., Winnsboro, S. C., has resigned to accept the superintendency of the Edgefield Mfg. Co., Edgefield, S. C.

George F. Keniston has resigned as overseer of spinning at the Pepperell Mfg. Co., Biddeford, Me., and John Sullivan has taken his place.

George Smith, overseer of ring spinning at the King Phillip Mills, Fall River, Mass., has resigned to accept the superintendency of a lace mill at Wilkesbarre, Pa. His help presented him with a roll top desk and a chair as a token of their esteem. His brother, Howard T. Smith, formerly boss spinner at the American Linen Co. and mills in Dover, N. H., will succeed him.

R. M. Norman, who was elected president of the Empire Mills Company, Columbus, Ga., has resigned, being physically unable to discharge the exacting duties of the office. Hugh Baird, who has been secretary and treasurer of the City Mills Company, has been chosen to succeed Mr. Norman as manager of the mills.

John S. Cuttle, overseer of the carding department of the Border City Mill No. 1, Fall River, Mass., assumed duties this morning as overseer of the carding room of the Pocasset Mill. Mr. Shaw of the Border City Mill No. 2 will take Mr. Cuttle's place, and Mr. Lapointe, secondhand, will fill Mr. Shaw's position.

Oliver D. Drew, superintendent of Mill No. 1, Peabody Mfg. Co., Newburyport, Mass., has resigned.

H. J. Smith, formerly of the Cocheco Mill, Dover, N. H., is the overseer of spinning, spooling and dressing at the King Philip Mills, Fall River, Mass.

George Rush, of Pelzer, S. C., is the new overseer of weaving in the Gluck Cotton Mill, Anderson, S. C.

C. F. Bradshaw, formerly of Gibsonville, N. C., has succeeded N. T. Brown, of Raleigh, N. C., as superintendent of the Nantucket Mills, Spray, N. C.

L. R. Small, formerly connected with the Moultrie (Ga.) and Yorkville (S. C.) mills, is now overseer of carding in the Quitman, Ga., Cotton Mill.

John H. Ottenheimer, recently with the American Thread Co., Willimantic, has succeeded Charles Murray as overseer in the spinning department of the Windham Mfg. Co., Wilimantic, Conn. Mr. Murray is now with the Grant Yarn Company, Fitchburg, Mass., in a similar capacity.

Charles N. Taylor, overseer of dyeing at the Tremont & Suffolk Mills, Lowell, Mass., has resigned.

Abel Cyr has severed his connection with the Sanford Spinning Company, and gone to Newburyport, Mass., where he will be overseer of spinning for the Peabody Manufacturing Co.

H. L. Love has resigned as boss weaver at the Cushman Mill, Monson, Mass., and has gone to Philadelphia to take a similar position. Henry C. Needham has taken his place.

Mr. Tobin, formerly boss finisher of the Dalton Woolen Mills, Dalton, Mass., is now located at Stafford Springs, Conn.

A. Kuhnert is now in charge of dyeing at the River View Worsted Mills at Waterville, Me.

W. J. Melrose of Montreal, has accepted a position in the weave room of the Assawaga Woolen Co., Dayville, Conn.

William Greaves, who has been an overseer at the Cranston Worsted Mill, Bristol, R. I., for several years, concluded his duties with that company recently. He will leave soon for Kent, O., where he will engage in business.

Michael Griffin, formerly with the Globe Yarn Mills, Fall River, Mass., will take charge of the spooling and twisting departments of the Kennebec Mills, Richmond, Me.

H. J. Forsyth, formerly with the Sibley Mfg. Co., Augusta, Ga., is now superintendent of the Cooleemee Cotton Mills at Cooleemee, N. C.

Woolen.

James Frederichs has resigned his position as overseer of dyeing for the Hinsdale Woolen Company, Hinsdale, Mass., and is moving with his family to Woonsocket, R. I., where he will enter a job dyeing establishment. Fred Philinaine of Holyoke takes his place.

G. L. Crossley has resigned as superintendent at the Barre Wool Combing Co., Barre, Mass.

D. J. Cullinan, Hartland, Me., has been engaged as superintendent of the Black River Woolen Mill in Ludlow, Vt., and entered upon his new duties the first of the year.

H. E. Whitaker is now boss finisher with the Appleton Mfg. Co., Reedsburg, Wis.

Thomas F. Nutt, formerly superintendent of the Empire Woolen Co., Clayville, N. Y., is now the manager of the Rockstone Mills Co., Downingtown, Pa.

John Sherwood, formerly of Mohawk, N. Y., is the new carder at the Granite Woolen Mills, West Swanzey, N. H.

Fred Teal has resigned as overseer of weaving at the Marston Worsted Mill, Skowhegan, Me.

Fred Pohnman is the new dyer at the Hinsdale Woolen Co., Hinsdale, Mass.

J. G. Burnes, of Providence, R. I., is now with J. W. Dimick Co., Rifton, N. Y., as overseer of combing, carding, and woolen and worsted spinning.

E. C. Vedder has resigned his position with the H. S. Barney Company to accept the management of the Watervliet Woolen Mills, Watervliet, N. Y.

Albert Thorpe, late overseer of spinning for the Pawcatuck Woolen Mills, Potter Hill, R. I., has been succeeded by William T. Morgan, of Adams, Mass.

Charles Bromley, Norwich, Conn., has accepted the position of boss carder with the Hampden Mills Co., Hampden, Mass.

P. J. Hurt, of Monson, Mass., has gone to Franklin Falls, N. H., as second hand of carding.

John J. Casey, late of Oswego, N. Y., has taken charge of spinning nights at Winooski, Vt.

Hiram Dawson of Rockville, Conn., assistant superintendent of the New England Mills at that place for 12 years, has taken charge of the designing department at the Scotia Mill, Woonsocket, R. I.

Herbert Newell, overseer of spinning of department No. 1 in Peacedale (R. I.) Mfg. Co., has resigned.

A. J. Mitchell has been engaged as superintendent of the Warren Woolen Co., Stafford Springs, Conn. Mr. Mitchell was formerly superintendent for the J. L. & T. D. Peck Mfg. Co. of Pittsfield.

Robert Harrington of Hinsdale, Mass., boss spinner in the Dalton Woolen Mill, has resigned, and his brother, John Harrington, has taken his place. The former has come to Boston to begin his legislative work as representative of the 5th Berkshire district.

Oscar W. Wall, of Woonsocket, R. I., has accepted the position of boss weaver with the Park Woolen Mills, Rossville, Ga.

Norman S. Russell of Hadley Falls, Mass., has gone to Tiffin, O., as boss spinner of the Tiffin Woolen Mills.

Peter Lee has recently resigned as finisher at the Assabet Mill, Maynard, Mass., to accept a position at Lawrence, Mass.

Fitz L. Putney resigns as general manager of the Rockstone Mills, Downingtown, Pa., March 1st, to accept another position.

Robert Whitehouse has resigned as overseer of weaving in the Peacedale Mill, Peacedale, R. I.

James Buchholz, overseer of dressing at the Chase Woolen Mills, Webster, Mass., has resigned, and William H. Kelbart, of the Merritt Woolen Co., Dudley, Mass., has taken his place.

Lawrence Carroll has resigned as overseer of spinning at the Pontoosuc Woolen Company, Pittsfield, Mass.

Arthur Wilkins, of Bennington, Vt., is the new overseer of spinning for the Hanover Woolen Mfg. Co., Hanover, Ill.

George Copeland, overseer of weaving, has changed from the Dunn Worsted Mills, Woonsocket, R. I., to the Peacedale, (R. I.) Mfg. Co.

Frank Greenhalgh, formerly of the Bay State Worsted Co., is the new boss finisher with the Daniels Worsted Co., Worcester, Mass.

John Henzie, superintendent at the Madison Woolen Co., Madison, Me., is the new agent at the Linn Woolen Co., Hartland, Me.

Miscellaneous.

William H. Hartley has been appointed to the position of teacher of designing, drafting and weaving and the construction of textile fabrics in the Fall River Textile School. Mr. Hartley has been one of the leading designers and card stampers of Philadelphia for a number of years, having one of the largest designing and card stamping rooms in the country from 1881 to 1891, sending out his work to all parts of the country wherever there were textile industries. He had charge of the designing room for Cheney Bros. for five years, and also was five years with Stead & Miller Co. as designer and card stamper.

David Sutherland, who in January issue was reported as being overseer of spinning at the Cable Flax Mills, Schaghticoke, N. Y., now has charge of the carding, preparing flax and tow, also spinning and twisting. Mr. Sutherland is an all-round practical man in this branch of the business.

Frederick W. Kavanaugh, of the F. W. Kavanaugh Mfg. Co., Cohoes, N. Y., has been elected sheriff of Saratoga County for a term of three years.

John H. Murphy, of the John H. Murphy Mfg. Co., Cohoes, N. Y., who has been the mayor of Cohoes for the past two years, retiring January 1st, has been appointed a fire commissioner in place of

John F. Quinn of the Pearl Knitting Co., Cohoes. Mr. Murphy was elected January 28th for a second term president of the Cohoes City Hospital Association. The Association has charge of the Cohoes Hospital.

A. S. Burnham has advanced to assistant superintendent of the Manchester Print Works, Manchester, N. H.

William Grandage, who has lately been superintendent of the Cooper Mercerizing Co., of Coventry, R. I., has recently been engaged to take charge of the dyeing department of the New York Mills, N. Y., and will assume charge the latter part of January.

Carl Hodges has been appointed overseer of the twisting room of the Hodges Fibre Carpet Co., Indian Orchard, Mass., in the place of James H. Harrison.

Fred Naylor, Philadelphia, has accepted the position of bleacher with the Columbian Bleaching and Dyeing Works, Schuylkill Haven, Pa.

Deaths.

Henry Abegg, of the firm of Abegg & Rusch, 90 Grand St., New York, died on Thursday evening, January 28th, at his home. His death occurred on his seventy-seventh birthday. He was born in Switzerland, and educated in his native land and came to the United States in 1847. He was in business for himself until the outbreak of the Civil War. Later he entered the employ of A. Rusch & Co., and soon became a partner. The son of the founder of the company is the surviving partner of the present firm of Abegg & Rusch.

James Wolstencroft, of Frankfort, Philadelphia, Pa., died on Christmas Eve, at his home in that city. He was manager for his father, William Wolstencroft, felt manufacturer. He was a prominent citizen and a member of several social and fraternal organizations.

Timothy J. Sullivan, for many years superintendent of the Pocasset Manufacturing Company, Fall River, Mass., died recently. He was widely among those interested in local manufacturing, who respected him highly for his sterling merit and extensive knowledge of mill affairs. Failing health forced his retirement about a year ago.

Willis W. Cooper, general manager of the Chicago-Rockford Hosiery Company of Kenosha, Wis., was among the victims of the Iroquois Theatre fire in Chicago. Charles F. Cooper, a brother, and factory manager of the company, also lost his life in the disaster. In their death the knit goods industry loses two of its most prominent men.

Andrew J. Sloan, a well known carpet manufacturer, died at his home on Race St., Philadelphia, Pa. Before his retirement, about eleven years ago, he was a member of the firm of McCallum & Sloan, which later became McCallum & McCallum.

George Sykes, one of the foremost woolen manufacturers of the country, died at his home in Rockville, Conn., December 23. The deceased was president of the Hockanum, Springville and New England Manufacturing Companies, and a man of sterling character. He was born in Honley, near Hudersfield, Yorkshire, England, in 1840. He accompanied his parents to this country in 1851 and they located in Millville, Mass. After receiving a common school education, he entered the E. S. Hall & Co. mill in Millville as a carding boy. Having a natural aptitude for the work, both his father and grandfather having been skilled in the woolen industry, he soon passed from one branch of the industry to another until he had thoroughly mastered all the details. Shortly after reaching his majority, he went to Cavendish, Vt., to take charge of the weaving department of the woolen mill of Frederick Fullerton & Co., and a year later he was advanced to the position of superintendent. In 1866 he came to Rockville to become manager of the Hockanum Mill. Since that time he had widened his influence until he had become recognized as one of the greatest manufacturers of America, advancing to the head of the large and prosperous plants of the Hockanum, Springville and New England Manufacturing Companies. Mr. Sykes leaves a wife, three daughters and one son.

Robert Rodman of North Kingston, R. I., the founder of the Rodman Manufacturing Company, died December 30th. The deceased, who belonged to one of the most notable families in Washington County, was born in 1818. He lived at his home until 22 years of age, when he entered into the manufacture of kersey at the Lawton Mill, in Exeter. In 1841 he hired a small mill in North Kingstown, where he continued the manufacture of kerseys until 1845, then sold out and went into farming and the coasting trade, and in 1847 purchased a mill in the village of Lafayette and began the manufacture of woolen goods and later Kentucky jeans. In the panic of 1857 he failed and paid fifty cents on the dollar. He again entered into manufacturing, and secured a contract from the government at the breaking out of the Civil War. It was at this time that Mr. Rodman's high sense of commercial honor was displayed, for at the earliest possible moment he sent checks for the full amount, with interest, due each of the creditors to whom he was indebted by his failure in 1857. He was one of the best known manufacturers in the State, and, indeed, in the Eastern States.

Jeremiah Mervin Allen, president of the Hartford Steam Boiler Inspection & Insurance Company, and one of the most able men, of insurance and finance in Connecticut, died recently in Hartford. The deceased was the son of Jeremiah V. and Emily (Pease) Allen, and was born in Enfield, Conn., May 18, 1833. He was educated at the academy in Westfield, Mass., with the view of becoming a civil engineer. He taught school for four years and then for several years was steward at the American Asylum for the Deaf and Dumb. In 1865 he began his insurance career. In that year he was made the general agent and adjuster of the Merchants' Insurance Company of Hartford, and later he accepted a similar position with the Security Fire Insurance Company of New York. The Manchester Steam Users' Association of England was organized in 1857, and about the same time Mr. Allen, with a coterie of young men of Hartford, had formed the Polytechnic Club. The conception of the Hartford Steam Boiler Inspection & Insurance Company resulted from this alliance, although that was not the purpose of its formation, which was purely educational. Mr. Allen furnished plans for many of the most extensive steam plants in the country, designing strictly by scientific methods to secure the highest degree of economy, efficiency and safety.

New Publications.

Pattern Design; Lewis F. Day; Charles Scribner's Sons, New York City. Price $3.00.

This work is the successor to The Anatomy of Patterns,which has gone through four editions. The author states in his preface that when he came to revise the old work for the fifth time it seemed as if he had done all he could to it and that the best way would be to start afresh. This he did and the result is the present work on pattern designing, which treats the subject in a very thorough and systematic way and has the additional merit of containing no extraneous matter. He has confined himself strictly to his subject and sought to treat that thoroughly. The work is freely illustrated and the following abstract of the table of contents will give an idea of its scope:

What Pattern Is; The Square; The Triangle; The Octagon; The Circle; The Evolution of Pattern; Practical Pattern Planning; The Drop Repeat; Smaller Repeats; Sundry Scaffoldings; The Turnover; The Turn-Round; Pattern Planning in Relation to Technique; How to Set About Design; To Prove a Pattern; Color; Borders; Pattern not Strictly Repeating; Expedients in Practical Design; The Invention of Patterns.

British Industries; edited by W. J. Ashley, M. A.; Longmans, Green & Co., London and New York. Price $2.50.

A series of lectures by specialists delivered under the auspices of the University of Birmingham a year ago, and treating of the different branches of the British industries. The subjects of the different lectures are as follows:

The British Iron and Steel Industries; The Midland Iron and Steel Wages Board; The British Cotton Industry; The Woolen and Worsted Industries of Yorkshire; The British Linen and Flax Industry; British Railways; British Shipping; The Trust Movement in Great Britain.

Form and Color (Form und Farbe); Rochga and Haustein; Julius Hoffmann, Stuttgart, German. Price $15.00.

This is a collection of colored plates having designs to be used for decorating surfaces such as walls and ceilings. Many of them are suited for dress goods designs. They present very attractive and beautiful designs and colorings. The collection will be of great value to every textile designer.

Color Tests in the Textile Industry (Koloristische und Textilchemische Untersuchungen); Dr. Paul Heermann; Julius Springer, Berlin. Price $3.00.

This work treats of the chemical tests to determine the nature of dyestuffs either in bulk or after having been applied to the fibre. The first part is devoted to the testing of coal tar dyestuffs before being applied to the fibres. It includes synoptic tables for dyes for cotton, wool, silk, mercerized cotton, artificial silk, jute, straw, wood and mixed goods. The second part relates to the testing of natural dyestuffs before being applied to the fibre. The third part treats of the identification and tests of mordants, dyestuffs and finishing materials on the fibre. The fourth part consists of synoptic tables showing the effects of the various reagents on colored fibres. The work will be of great value as a book of reference as well as a practical handbook for the dyer and chemist. The text is in German.

Business Literature.

Textile Texts, Draper Co., Hopedale, Mass.

The second edition of Textile Texts contains much new material which increases the value of what has become a handbook of cotton manufacturing. It includes special chapters on carding, spinning, spooling, warping, dyeing, reeling, twisting and weaving, besides numerous tables and a full list of the cotton machinery built by the Draper Company.

Gas Engines; Power and Mining Machinery Co., New York City, formerly Loomis-Pettibone Gas Machinery Co., and successor to The Holthoff Machinery Co.

This is an illustrated catalogue describing the gas engines built by this well known firm.

Knowles Pumping Machinery; Knowles Steam Pump Works, New York City.

A good sized illustrated catalogue describing the pumping machinery built by the Knowles Steam Pump Works.

Mechanical Induced Draft; Buffalo Forge Co., Buffalo, N. Y.

An illustrated booklet on the system of mechanical induced draft which is installed by the Buffalo Forge Co.

Compound Engine Test; Buffalo Forge Co., Buffalo, N. Y.

This book gives the results of a test of Buffalo Forge Co.'s engine, No. 1256, and will be of interest and value to all interested in steam engineering.

Buffalo "B" Volume Blowers and Exhausters; Buffalo Forge Co., Buffalo, N. Y.

An illustrated catalogue of the blowers and exhausters built by this company.

Fire and Feed Pumps; Buffalo Forge Co., Buffalo, N. Y.

A leaflet describing the Buffalo blowers and feed pumps.

Cotton Facts; Albert Shepperson, New York City.

The 1903 edition of this well known publication has reached us and contains the usual large amount of valuable information. It has been brought thoroughly up to date. This little book is indispensable to every one who desires to be well informed regarding the cotton industry.

New Calendars.

Shaw Stocking Co., Lowell, Mass.

A neat calendar of convenient size decorated with a half tone engraving of a young girl.

Big Brushy Coal and Coke Co., Harriman, Tenn.
A handsome calendar having a reproduction of the painting "Rosalie," by A. Asti.

Whitin Machine Works, Whitinsville, Mass.
A very business-like calendar showing a view of the Whitin Machine Works.

Shultz Belting Co., St. Louis, Mo., J. H. Ferguson, Manager, Boston, Mass.
A calendar ornamented with an excellent colored print of a painting by A. Asti.

Wm. H. Lorimer's Son's Co., Mercerized Yarns, Philadelphia, Pa.
This firm is sending out a very artistic calendar ornamented with an excellent reproduction of "The Critic," by Carl Witowski.

Oils that do not Drip; New York and New Jersey Lubricant Co., New York City.
This is the title of a booklet issued by the New York and New Jersey Lubricant Co., 17 Church St., New York City, which will be of much interest to engineers and users of lubricating oils generally. The above concern has during the past three years or more made a very careful study of the requirements of textile mill lubrication, and has made up special gravities of non-fluid lubricating oils for this industry. They can be used in place of stainless oils, greases, tallows, etc., for twister rings, bearings of front-rolls, shell-rolls, tin cylinder bearings, etc., on spinning frames and mules; bearings of pickers and cards (particularly comb-boxes on revolving flat cards); bearings and drums of winders, cams of looms and in short any bearings of the lower machinery where fluids oils run off the bearings and grease or tallow catches the dust and flyings. The booklet will be sent free to those interested.

Annual Meeting.

At the annual meeting of the American Soap & Washoline Co., Cohoes, N. Y., Jan. 28th, the following officers were elected:
Hugh Graham, President and Treasurer.
E. A. Graham, Secretary.
Charles G. Andrae, Manager.
Mr. E. A. Graham of the company has been re-elected for a second term as secretary of the Cohoes Hospital Association.

Steam Fittings.

The Lunkenheimer Company, Cincinnati, makers of superior brass and iron steam specialties, report that owing to the growing demand for their specialties, they have again greatly increased their facilities and are now in position to guarantee reasonably prompt shipments. They also report through their foreign branches an increasing export demand for their goods and inform us that they will shortly place upon the market some new specialties, which will be described in a very complete catalogue to be issued in a few months.

The J. B. Harris Steam Boiler Furnace.

Our readers, who are already familiar with the J. B. Harris steam boiler furnace, will be interested in the following letter from a manufacturer who has had this furnace in operation for some time and is thus able to judge it by actual results:

Goldville, S. C., Jan. 26th, 1904.
Dr. J. B. Harris,
71 Arcade Building, Nashville, Tenn.
Dear Sir:
Enclosed find my check for $139.95 to pay balance on furnaces.
I am both delighted and surprised at the work of the furnaces, and they are certainly a surprise and delight to us all.
At our next board meeting I am going to try to get these furnaces attached to our other mill's three boilers. What will you charge us for these furnaces to the other mill's boilers?
I am going to get every other mill man I can to examine and take note of the results these furnaces give.
Yours very truly,
L. W. C. Blalock, Secy. & Treas.,
Banna Cotton Mills.

We understand that a number of other mills are arranging to equip with the Harris furnace and we advise manufacturers to investigate this system, which is designed to effect absolute combustion of soft coal. Among the claims made for it, which the above letter substantiates, are the following: economy of fuel, flues and sheets always clean, higher evaporation, low first cost, minimum repairs, durability, adaptability to any kind of fuel, including crude oil.
Further information can be had upon application to J. B. Harris, M. D., 71 Arcade, Nashville, Tenn.

The Reading Wood Pulley.

The Reading wood pulley has now been on the market for a number of years, and during that time there has been ample opportunity of demonstrating its merits. One of the strong points is the iron hub, with wood face and arms, thus getting the advantage of a wood belt surface and all the conveniences of a split pulley, with the strength and grip of a solid iron pulley on the shaft. The grip of the hub on the shaft is independent of the rim, and all pulleys are turned on their own hub, and, therefore, are perfectly true and carefully balanced. The special construction admits quick adjustment of the shaft. It is built by the Reading Wood Pulley Co., Eleventh and Mulenberg Sts., Reading, Pa. A price-list has recently been issued, covering all sizes, in convenient form, and will be mailed on application.

Sizing and Softening Compounds.

The Arabol Manufacturing Company, 100 William Street, New York, are among the largest manufacturers of sizing compounds, softening oils, softeners, etc. They are well equipped for producing strictly modern compounds based upon the best practical and scientific experience that can be ob-

tained. Their facilities for supplying the needs of mills as regards sizings, softeners and finishing compounds are unexcelled. If, in ordering, a full explanation is given as to the class of goods used, the kind of "feel" desired, and also as to the hardness or softness of the water, the goods best adapted for any particular work are obtained.

Crane Mfg. Co. Purchase the Pepper Machine Works.

Announcement is made that the business of the Pepper Machine Works has been sold by the estate of the late Mr. Sanders to the Crane Mfg. Co., of Lakeport, N. H. The Crane Mfg. Co. will carry on the business in connection with its own line, with which it will work in perfect harmony, and customers of the old concern may be assured of having their requirements promptly and intelligently attended to.

The Vacuum Dyeing Machine Proves Very Satisfactory.

The following letter recently received by the Vacuum Dyeing Machine Co. is self explanatory:

Office of Tremont & Suffolk Mills,
Lowell, Mass., January 14th, 1904.

The Vacuum Dyeing Machine Co.,
Chattanooga, Tenn.

Gentlemen:

Replying to your inquiry in regard to what we think of your raw stock dyeing machine, would state, that we have been using one about six months, with very satisfactory results, the dyeing being level and the stock left in first-class condition for spinning.

Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly,

(Signed) J. J. Connell, Agt.

The G. Drouve Company.

The new device known as the Lovell apparatus for operating sashes and shutters recently placed on the market by the G. Drouve Company, of Bridgeport, Conn., is destined to revolutionize the business. The ready response this apparatus has called forth from mill owners, railway companies, factories, etc., has been such that over 60,000 feet have been sold in the past year. With this apparatus a line of sash 500 feet long can be operated from one station if desired. It makes no difference what kind of sash is to be opened, the apparatus working equally well with the sash hung from the top, pivoted at the sides or at the top and bottom, or hinged at the bottom. It can also be applied to sliding or ordinary lifting windows. As the operating station for an entire building is, unless otherwise ordered, always placed on the wall at the end or side of building, in case of fire the windows can be quickly closed while the people are leaving the building. This is a feature which will appeal at once to the owners of large factories and mills, railway companies, etc. Owners of factories and mills have long been looking for a system which would give perfect ventilation and permit of being operated quickly and easily. The apparatus is strong, durable and practical, and the G. Drouve Company feel confident that they have at last succeeded in producing a perfect opening device, and they will cheerfully submit estimates for erecting the apparatus in any part of the country. Their skylights and sheet metal work is favorably known and their factory at Bridgeport is a very busy place.

Lakewood as a Home.

There is and has ever been a power of attraction about the homely old word, home. It is spoken with fixed and full content by those who have gained the right; with wistful longing by others who are wanderers and birds of passage. For so small a grouping of common letters, the little word includes more than any other, carrying a sense of safety and responsibility; association and freedom; rest and possession—to all, without class distinction.

Nothing so certainly fixes the stamp of safety upon the growth of Lakewood as the fact that each season finds the place more and more a home resort. The view of such progress is satisfactory because it implies and proves the presence here of the best of conditions. Men of affairs do not, upon haphazard impulse, invest in land and expensive houses and furnishings; they do not bring their families for a stay of months to any location on chance, but because after observation and tests they have found certain advantages to commend a given point.

What are such advantages, with reference to Lakewood?

With its healthfulness, sports, and other attractions elsewhere mentioned, the accessibility of the place from great business centres is an undoubtedly strong argument among busy men; the fact that private and public schools of the first class are being constantly improved also carries weight to the parents of delicate children, while the churches and the library of the village count as factors of advantage among those who would live among conditions of health, moral and mental as well as physical.

Vanity Fair was famous for its gaiety, but yet a poor place for homes, and that each year new and attractive homes are here established is to the credit of Lakewood, as well as a recognition of her manifold merits.

Booklet 341 issued by the New Jersey Central, General Passenger Department, Central Building, New York City, contains pictures and information on Lakewood worth reading. Send for it, it's free.

The Jeffrey Manufacturing Company of Columbus, Ohio, through its connection with the Ohio Malleable Iron Company, of the same place, are now in the field soliciting orders for high grade malleable castings.

Nothing as Good.

Castleton, Rens. Co., N. Y., Jan. 25, 1904.

Please change my address for Textile World Record from Kinderhook to Castleton, Rens. Co., N. Y. I am running Lamb knitting machines, making gloves, mittens, wristlets, etc., and am getting all the orders I can fill for three months. Have not yet been on the road. There is no publication that is as good as the Textile World Record. I am starting a library with them.

C. F. Ganson.

Change in Dyestuff Firm.

S. J. Corey, importer and dealer in dyestuffs and chemicals at 273 Congress St., Boston, announces that hereafter the firm will be known as The S. J. Corey Co. M. B. Fletcher, who has been in Mr. Corey's employ for a number of years, becomes associated with him. The business of the Enterprise Chemical Co. and all its stock has been transferred to the S. J. Corey Co., and Mr. George Price, the manager of the Enterprise Chemical Co., enters Mr. Corey's employ and attends especially to the interest of the patrons of that company.

Running Full Time Again.

The Hopkins Machine Works, whose factory at Bridgeton, R. I., was burned last October, have their new shops rebuilt and entirely fitted up with modern machinery, especially designed to manufacture their line of fulling mills, cloth washers, piece dyeing machines, specking and burling machines, dye tubs, vats and tanks, etc., and, indeed, are prepared to do any and all kinds of machine work. They have recently installed one of their large eight string washers at the Oakland Worsted Mill, Oakland, R. I.

Visitors to Lakewood.

Recalling the epigram of olden days, when all roads led to Rome, a similar thought might easily be applied to Lakewood as a point of rendezvous for the world's celebrities and men and women of mark in various walks of life.

In the relative location of a suburb for two great cosmopolitan cities, it is a matter of course that at one time or another during the season the passing throng in Lakewood should include the most highly honored representatives of public or private life. From season to season the list of such visitors would be an interesting one, including what may be termed "the home guard" of those who have chosen Lakewood as a winter home.

The cottage list of the place carries the names of students and workers; people whose accomplishments have been notable in the world, and whose interest in their surroundings guarantees continued improvement. And when the casual visitors to Lakewood are considered the list might stretch out indefinitely. In the corridors of these hotels during a season, one touches elbows with grave college professors, eminent clergymen, learned doctors of law and letters and abtruse sciences of all classifications. Government attaches and ambassadors, prominent politicians who are readily marked, and quiet ones unsuspected as the actual power behind many a petty throne. The great song birds of the operatic and concert world come here for occasional rest, and artists and literatteurs and scientists are noted in the crush.

While millionaire operators, successful business men, and women of the first social prominence, make up the resort's guest list. And Lakewood receives them all with ready welcome. She opens her doors and invites them in for the rest they need; proffers them either the peace and quiet of the wood, where none intrude, or the pleasant associations to be found in club society or hotel and cottage circles, as their preferences may turn.

If you wish to know about Lakewood, send postal to C. M. Burt, General Passenger Agent, New Jersey Central, 143 Liberty Street, New York City, for book.

Breton Oil for Wool.

One of the most familiar wool oil brands in the market is that with the trademark of the Breton oil, the well-known ram's head in a circle. This wool oil has been used for many years in woolen mills all over the country, and has always been very popular in New England. It is sold direct by the manufacturers, and being made under their personal supervision and with a knowledge of the requirements of each customer insures uniformity in quality from month to month, and in this respect has the advantage over oils sold by jobbers and dealers, who may change their source of supply.

The Philadelphia Water Purification Company has in its immediate vicinity some of the severest problems to solve. Its references are its customers. It installs filters on both pressure and gravity systems, and also builds water softeners of intermittent and continuous systems. In the March issue of the magazine an illustration of one of their systems will be shown.

Recent Textile Patents.

BALE TIE. 749,847. Wallace B. Curtis, Jamestown, N. Y.

BALING PRESS. 750,232. Ernest D. Smith, Lockhart, Texas, assignor of one-half to Francis B. Hillyer, Lockhart, Texas.

BALING PRESS. 749,759. Albert C. Tinsley, Fay, Texas.

CARD FEEDING MACHINE. 749,649. Douglas H. Waters, Poquetanuck, Conn., assignor to Eddo V. Bates, Dracut, Mass.

COTTON CHOPPER. 750,138. David Washington, Rusk, Texas, assignor of two-thirds to Juan Navarrete and Allan Matthews, Rusk, Texas.

COTTON PICKER'S BAG. 749,722. Francis M. Dalton and James G. Walker, Murdock, Oklahoma.

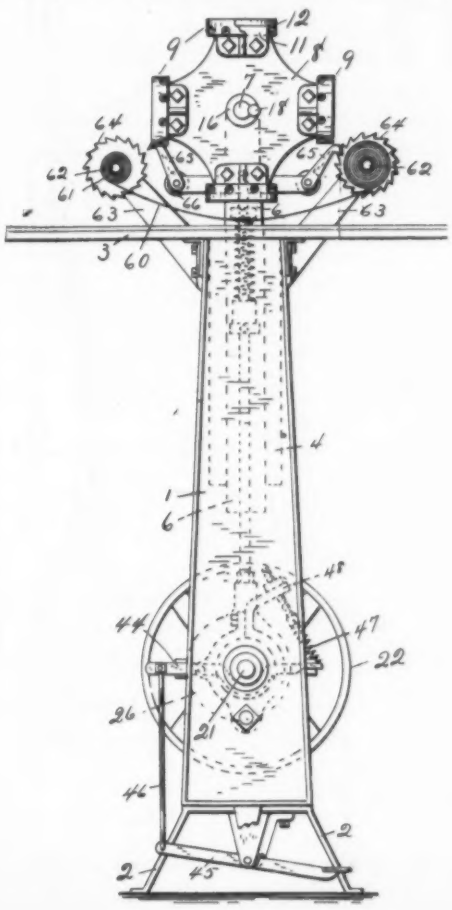
DECORTICATING MACHINE. 749,475. Henry A. Clifford, San Francisco, Cal.

FABRIC CUTTING MACHINE. 748,853. Henry Faltermayer, Philadelphia, Pa., assignor to Adams Top Cutting Machine, East Orange, N. J.

FABRICS. Machine for Shaping and Trimming Pieces of. 748,476. Henry Bryce, Troy, N. Y.

FABRIC MARKING MACHINE. 748,854. Michel J. Fisher, Utica, N. Y.

This invention relates to a machine for marking shirts or other garments as a guide to the cutter. It is adapted to a great variety of uses where a large number of garments or pieces of fabric to be made into garments or otherwise used are to be marked for cutting. This machine is particularly adapted for marking the neck-opening of knit shirts, in which large quantities are produced on knitters of any desirable description and afterward finished by hand. It is important to mark them clearly with certainty and rapidity to guide the cutter and finisher, to whom they are handed over. The mark must be clear and not easily erased by the handling of the garments.



The essential features are an upright supporting-frame, a horizontal table thereon for the garment to be marked, a slide or standard fitted to the frame and adapted to be elevated and depressed therein, a plate or turret-head journaled on the upper end of the standard carrying a suitable number of forms or dies for the different sizes of garments, means to rotate the plate at will to bring the proper die in position to engage with and mark the garment when the slide is depressed, means to lock the plate in position when the proper die is in low position, and suitable mechanism released or tripped by the foot to depress the standard to effect the desired operation of marking the garment. A carbon ribbon on suitable rollers is preferably used to impress the garment with a substantially indelible mark. This ribbon may be supported on suitable rollers and shifted by hand as often as desired or automatically shifted by ratchet or other similar mechanism operated by the standard.

GLOVE OR MITTEN. 748,187. Sidney Hollenbeck, St. Paul, Minn., assignor to Gordon and Ferguson, St. Paul, Minn.

GLOVE TURNING MACHINE. 748,463. Walter S. Ayres, Washington, Iowa.

LOOM. 749,890. Arnold Wolfensberger, Hoboken, N. J.

LOOM FILLING BOX STAND. 748,438. Joseph Trahan, New Bedford, Mass.

LOOM FILLING DETECTING MECHANISM. 749,364. Edward Cunniff, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Kindergarten. 748,120. Martha P. Todd and Dana Todd, Minneapolis, Minn.

LOOM LET-OFF MECHANISM. 748,253. Frederick Benz, Jr., Haledon, N. J., assignor to Frank & Dugan, Paterson, N. J.

LOOM. Pile Fabric. 748,084. Paul Leroux and Edmund Leroux, Roubaix, France.

LOOM PILE WIRE MOTION. 749,443. Henry K. Martin, Chicopee, Mass.

LOOM SHUTTLE. 749,353. Alfred Baldwin, Goffs Falls, N. H.

LOOM SHUTTLE. 747,993. John Marugg and John Ruppert, Jersey City, N. J.

LOOM SHUTTLE AND QUILL. Narrow Wear. 748,887. Edmund H. Sawyer, Lexington, Mass.

LOOM SHUTTLE MOTION. 748,273. Joseph Frank, New York, N. Y., and Frederick Benz, Jr., Haledon, N. J., assignors to Frank & Dugan, Paterson, N. J.

LOOM TAKE-UP. 748,262. Arthur F. Caswell, Taunton, Mass., assignor of one-half to Herbert H. Shumway, Taunton, Mass.

LOOMS. Web Supporting or Guiding Means for Narrow Wear. 748,274. Joseph Frank, New York, N. Y., and Frederick Benz, Jr., Haledon, N. J., assignors to Frank & Dugan, Paterson, N. J.

LOOM FOR WEAVING FIGURED GOODS. 750,015. Alexandre Barbier, Claude Charmetant and Joseph Grassy, Lyons, France.

LOOM WEFT REPLENISHING MECHANISM. 749,979. William H. Baker, Central Falls, R. I., and Frederic E. Kip, Montclair, N. J.

LOOM WEFT REPLENISHING MECHANISM. 748,105. Hugh R. Ross, Andrew McKee, Andrew Laird and Robert McKeown, Belfast, Ireland.

LOOM SHUTTLE. 747,300. Henry Cote, Woonsocket, R. I., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE Box Motion. 746,333. Federico Hofmann, Turin, Italy.

LOOM SHUTTLE Lubricating Device. 746,131. David McTaggart, Worcester, Mass.

LOOM STOP Motion. 747,856. Joseph Coldwell and Christopher Gildard, Fall River, Mass.

LOOM SWIVEL. 745,538. Joseph Wadsworth, Paterson, N. J.

LOOM TEMPLE. 747,879. Elmer S. Fling, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Evening Mechanism. 747,310. Everett S. Wood, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 747,311. George B. Ambler, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FOR WEAVING Pile Fabrics. 747,587. James Buckler, Worcester, Mass.

PILE FABRIC. Double. 749,219. Fred Pearson, Philadelphia, Pa.

SPINNING MACHINES. Fibre Gathering Can For. 750,131. Guido Stiehle, Seltmanns, Harbatzhofen, Germany.

SPINNING MACHINE RING RAIL MOTION. 749,521. Manton T. Bentley, York, Pa., assignor of one-half to York Silk Manufacturing Co., York, Pa.

SPINNING MULE. 750,026. Henry S. Golland, Worsley, England.

SPINNING RING. 749,189. David Harrington, Worcester, Mass.

SPINNING AND TWISTING MACHINE. 749,470. Charles T. Atherton, Pawtucket, R. I., and Abel T. Atherton, Warwick, R. I.

WARP STOP MOTION MECHANISM. 748,168 John V. Cunniff, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

WEFT FORK. 748,096. Thomas Pickles and Benjamin Blakey, Burnley, England.

HOSIERY FROM SHRINKING. Device for Preventing. 743,034. Laura E. Roach, Bathbeach, N. Y.

The subject of the present invention is a device more particularly designed for preventing hosiery from shrinking, and has for its principal objects high efficiency, adjustability to serve with different sizes of stockings and half-hose, lightness, durability, and inexpensiveness of construction.

With the above purposes in view the invention consists of a form or frame having the general outline of a stocking and equipped with provision whereby the foot and other portions thereof may be increased or diminished in size.

A development of the invention involves a form or frame made from a single piece of stout wire possessing a considerable amount of spring and bent to present an upper suspending-hook, also adapted to serve as a handle, an extended leg portion, and a foot portion, the terminal parts of the wire which occur at the foot portion being so

peculiarly disposed as to permit said foot and leg portions to be adjusted to assume one of several sizes and be positively secured to retain the parts in any of said adjustments.

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65 Franklin Street, BOSTON, MASS.

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CONSTRUCTION DE MACHINES, Ci-Devant, F. J. Grun. French Worsted Machinery.

HOYLE & PRESTON, Noble Combs, Back Washing Machines, etc.

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JOHN HAIGH & SONS, Ltd., Woolen and Worsted Cards, Fearnoughts, Feeds, etc,

THOS. BROADBENT & SONS, Hydro Extractors, Patent Suspended Steam and Electrical Driven, Machines kept in stock in Boston.

JOHN WHITELEY & SONS, Card Clothing for Cotton; Tempered Steel, Plough Ground, Needle Pointed.

L. M. TETLOW & SONS, Card Clothing for Woolen and Worsted; Tempered Steel, Needle Pointed.

J. GREENHALGH & SONS, Cotton Waste Willows, for Fly, Strips, Picker Droppings, etc.

DRONSFIELD BROS., Ltd., Grinding Rolls and Emery Filleting. Stock kept in Boston.

SPINDLES, FLYERS, FLUTED ROLLS, ETC.

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You can run your belts tight with Cling-Surface or you can run them slack, as you like; but you can't run them slack without Cling-Surface for they slip even when they are tight.

Mr. C. M. Benson (late of Valley Mills, Cherry Valley, Mass., and now Treas. Powhattan Mfg. Co., Chester, Pa.) says: "I have started 48-inch cards from a dead start without any slippage of belt on cylinder pulley."

Cling-Surface pays every day. Place a trial order and see for yourself.

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SINGLE DISC, DOUBLE SEATED

In Screw Ends, from ¼ to 6-Inch Sizes.
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Best in quality, lowest in price, the engineer's favorite. These Valves are made of cast iron and all wearing parts of gun metal. They are superior to common, cheap brass valves. Why? *Because* they possess all the advantages of a cast-iron pipe fitting, are heavy and rigid—not injured by expansion and contraction or rough handling in pipe fitting. *Take pressure from either end.* Body and hub held together by a steel clip, consequently always easily taken apart. Joint between body and hub made permanent by an imbedded seamless oval copper wire washer. If you desire the *best, strongest* and *most durable* valve for general purposes, on all ordinary pressures, use this valve. *Fully warranted to satisfy.* Made also in All Iron for Cyanide and other acids. Specify them and order through your dealer. Write for catalogue. Sole Makers and Patentees,

THE LUNKENHEIMER COMPANY,
Main Offices and Works: CINCINNATI, OHIO, U. S. A.
BRANCHES: New York, 26 Cortlandt St., London, 38 Great Dover St.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Putnam & Co.

Air Moistening System.
American Moistening Co.

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Smith, Jas., Woolen Machinery Co.
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Asaia Co.

Balling Machine.
North Chelmsford Machine Co.
Torrance Mfg. Co.

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——See under Yarns.

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——See also Mill Supplies.

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——See Paper Boxes.

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New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

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——See under Perforated Metal.

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——See Napping Machines.

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——See also Dyeing, Bleaching, Machinery, etc.

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Smith, Jas., Woolen Machinery Co.
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Birch Bros. Co. (Somerville Mchn. Works).
Luther, C. A. & Co.

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——See Paper Tubes.

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——See under Perforated Metal.

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Crompton-Thayer Loom Co.
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Curtis & Marble Machine Co.
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Elliott & Hall.
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Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.
Leigh, Evan A.
Lever, Oswald.
Lowe, Stephen C.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schofield, Geo. L.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

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Howard & Bullough American Mach. Co.
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Blaisdell, Jr., Co., S.
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Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hartford Blower Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
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Philadelphia Textile Machinery Co.
Power Specialty Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Somerville Mach. Wks.
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Textile Finishing Machinery Co.

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Bull, William C.
Pearson, J. T.

Dusters.
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Dust Collectors.
Allington & Curtis Mfg. Co.
Hartford Blower Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Blissville Mills.
Brophy's, T., Sons.
Cooper Mercerizing Co.
Cranston Worsted Mills (yarns).
Davidson, J. F.
Drexler, W. M. & Co.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Keystone Fast Black Dye Works.
Lorimers, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Pennypack Yarn Finishing Co.
Providence Mills Mfg. Co.
Rowland, Samuel.
Whittier Mills.
Wild, Chas. E.

Dyeing, Drying, Bleaching and Finishing Machinery.
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American Drying Machinery Co.
American Yarn Dyeing Machine Co.
Antisdel, E. M. (Knit Dryer).
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Birch Bros. Co. (Somerville Mchn. Works).
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Dubois, A. N.
Empire Laundry Machinery Co.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fairmount Machine Co.
Gessner, David.
Hartford Blower Co.
Heathcote, John & Son.
Hopkins Machine Works.
Howard Foundry & Mch. Wks.
Kenyon, D. R. & Son.
Leigh, Evan A.
Leyland, Thos. & Co.
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Philadelphia Textile Machinery Co.
Rothe, O. & P., Man. & Supply Co., Ltd.
Smith, Drum & Co.
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Sturtevant, B. F. Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Wing, L. J. Mfg. Co.

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Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Dillon & Co.
Dubois, A. N.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Fortner, L. B.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Holliday & Sons, Ltd.
Johnson, Chas. A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
N. Y. & Boston Dyewood Co.
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Sterling Electric Mfg. Co.

Electric Lighting.
General Electric Co.

Electric Motors.
General Electric Co.
Sturtevant Co., B. F.

Electrotyping and Printing.
Smith Bros.
Whitcomb, H. C. & Co.

Elevators.
Cohoes Foundry & Machine Co.
Howard Foundry & Mch. Wks.
Jeffrey Manufacturing Co.
Morse, Williams & Co.
Salem Elevator Works.

Employers Time Recorders.
Riggs & Brothers.

Exhaust Heads.
Burt Manufacturing Co.
Hartford Blower Co.
Pittsburg Gage & Supply Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
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Feed Water Heaters.
Green Fuel Economizer Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
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Scaife, W. B. & Sons.

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Filters.
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Phila. Water Purification Co., The.
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Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Boston Belting Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Lawson, Samuel & Sons.
Leigh, Evan A.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Leigh, Evan A.
Textile Machinery Co.

Forges.
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Sturtevant Co., B. F.

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Friction Cones.
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Green Fuel Economizer Co.

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Fulling Mills for Woolen Goods.
Hopkins Machine Works.
Hunt, Rodney, Machine Co.
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Smith, Jas., Woolen Machinery Co.

Gas Engines.
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Gas Exhausters.
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Gaskets (Rubber).
Boston Belting Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
Standard Gauge Mfg. Co.
Walworth Manufacturing Co.

Gearss.
Horsburgh & Scott.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

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Watson, L. S., Mfg. Co.

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Hosiery Boards.
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Hosiery Labels.
Saranac Electrical Mfg. Co.

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Humidifying Apparatus.
American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
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Empire Laundry Machinery Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

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Lunkenheimer Co.

Ironing Machines for Knit Goods.
Empire Laundry Machinery Co.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods Finishing Machines, Crochet, Etc.
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Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Willcox & Gibbs Sewing Machine Co.

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Increase Your Production

Your employees will turn out more work when they have good air to breathe with ample heat in winter and proper ventilation in summer

Use the

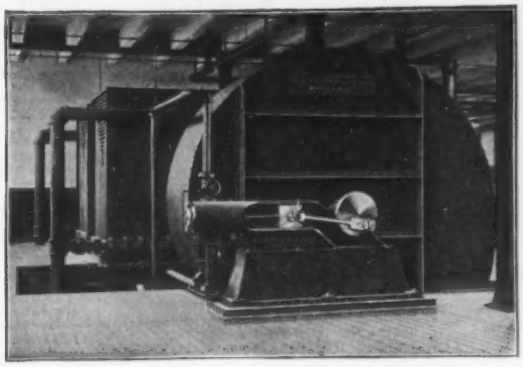
Sturtevant System

of

HEATING and VENTILATION

A centralized plant under one man's control.

No scattered steam piping, no hammering of steam pipes, no leaky joints.



A forced circulation of air by means of a fan.

Operation independent of weather.

Exhaust steam utilized.

B. F. STURTEVANT CO.

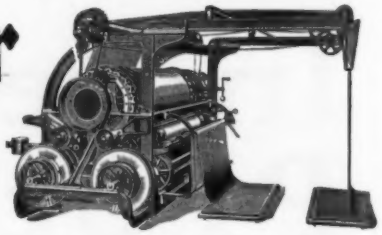
Boston, Massachusetts

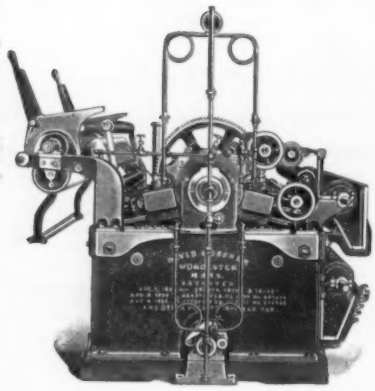
NEW YORK PHILADELPHIA CHICAGO LONDON

348

David Gessner

Worcester, Mass.

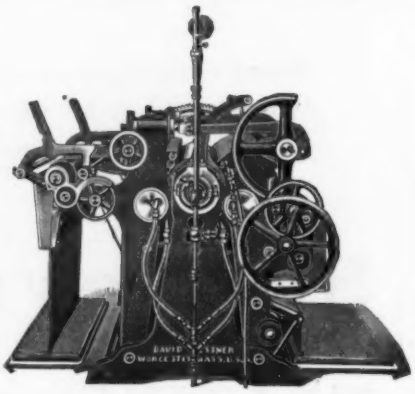




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Knitting Machine Cylinders.
Paxton & O'Neill.
Ruth Automatic Knitting Machine Co.
Stafford & Holt.
Stanton & Lewis.

Knitting Machinery.
American Knitting Machine Co.
Branson Machine Co.
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Champion Machine Co.
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Cooper, Chas.
Crane Mfg. Co.
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National Automatic Knitter Co.
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Nye & Tredick Co.
Paxton & O'Neill.
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Richter, Wolfgang.
Ruth Automatic Knitting Machine Co.
Schoebel, Walter
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
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Dodge Needle Co.
Freeman Bros.
Ives, Loyal T.
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Lamb Knitting Machine Mfg. Co.
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Mayo Knitting Machine & Needle Co.
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Saranac Electrical Mfg. Co.

Laboratory Outfits.
Feidt, Geo. D. & Co.

Looms.
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Crompton-Thayer Loom Co.
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Mason Machine Works.
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Stoddard, Haserick, Richards & Co.
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Loopers.
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Leighton Machine Co.

Lubricators.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

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Machinery Dealers.
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Bamford & Smith.

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The New

Crompton-Thayer Loom Company

.. MANUFACTURERS OF ..

FANCY LOOMS

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

Dobbies, Box Motions and Supplies.

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677 Cambridge Street, Worcester, Mass.

Mill Supplies—cont.
Barker, James.
Brigham, Arthur A.
Buckley's, Benj. Son, Gun Mill.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Dodge Mfg. Co.
Easton-Burnham Co.
Hartford Blower Co.
Jefferson, Ed. & Bro.
Jeffrey Manufacturing Co.
Johnson Novelty & Mill Supply Co.
Lane, W. T. & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W. & Co.
Philadelphia Drying Machinery Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Riley, C. E. & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Sweet & Doyle.
Thurston, A. G. & Son.
Tucker, W. W. & C. F.
Ward & Vandegrift.
Walworth Manufacturing Co.
Watson, L. S., Mfg. Co.

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City Forge & Iron Works.
Towsley, John T. Mfg. Co.

Napping Machinery.
American Napping Machine Co.
Borchers, Richard C. & Co.
Columbia Napping Machine Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.
Parks & Woolsen Machinery Co.
Woonsocket Napping Machinery Co.

Noils (Silk)
Malcolm Mills Co.
Ryle, Wm. & Co.

Numbering Machines.
Force, Wm. A., & Co.

Oil Cups.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
Walworth Manufacturing Co.

Oil Filters.
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.

Oils.
Borne, Scrymser Co.
Loos & Dilworth.
Murphy, E. W. & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oilless Bearings.
Arguto Oilless Bearing Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Overhead Tracks.
Cohoes Foundry & Machine Co.
Putnam & Co.

Overseaming Machines.
Champion Machine Co.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Oxidizing Machinery.
Dubois, A. N.

Packing.
Boston Belting Co.

Paint.
Standard Paint Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper Tubes.
Sayford Paper Specialty Co.

Paper.
Richardson Bros.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.
Siggers & Siggers.
Straley, Hasbrouck & Schloeder.

Perforated Metals.
Allis-Chalmers Co.
Beckley, A. J. & Co.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B. & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
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Power Transmission Machinery.
Allis-Chalmers Co.
American Drying Machinery Co.
American Pulley Co.
Cohoes Foundry & Machine Co.
Dodge Mfg. Co.
Evans, G. Frank.
Horsburgh & Scott.
Howard Foundry & Mch. Wks.
Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Pittsburgh Gage & Supply Co.
Philadelphia Drying Machinery Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, Wm. Co.
Sellers, William & Co.
Smith, Jas., Woolen Machinery Co.
Speed Changing Pulley Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Atherton, A. T., Mach. Co.
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Smith, Jas., Woolen Machinery Co.

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Boomer & Boschert Press Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Howard Foundry & Mch. Wks.
Miller Press & Machine Co.
North Chelmsford Machine Co.
Spence & Rideout.
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Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Pulleys.
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FORSYTH'S

New Type Reinforced

RUBBER ROLLER

Patented July 7, 1903.

Adapted for

Wool Scouring and Carbonizing, Raw Stock Dyeing, Cotton and Yarn Squeezing and Dyeing

This type of roller, built upon the sectional principal, is superior to all other similar rollers and thorough tests have demonstrated that it will successfully withstand hard and severe service.

When the covering is injured, the user can himself apply one or more new rubber rings which will make the roller as good as new—a saving in time and expense.

The construction of this roller, both metal and rubber is the best and strongest possible. Full information and descriptive pamphlet sent upon application.

Mechanical Rubber Goods of every description

Manufactured by

BOSTON BELTING CO.

JAMES BENNETT FORSYTH, General Manager.

BOSTON	NEW YORK	BUFFALO	PHILADELPHIA
256-260 Devonshire St.	100 Reade St.	90 Pearl St.	14 N. Fourth St.

RUBEROID ROOFING

(Trade Mark Registered.)

STANDARD FOR TWELVE YEARS.

The only prepared Roofing for mills, factories, foundries, etc., which has proved its ability to resist the severest conditions. Proof against water, acids, heat, alkalies, gases, fumes, etc. Fire-resisting. Practically indestructible. Outlasts tin and iron. Send for samples and Booklet I.

THE STANDARD PAINT COMPANY,

104 WILLIAM STREET, NEW YORK.

Pumps.
Allis-Chalmers Co.
Goulds Mfg. Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Kennicott Water Softener Co.
Norwood Engineering Co.
Philadelphia Water Purification Co.
Scaife, W. B. & Sons.

Quillers.
Foster Machine Co.
North Chelmsford Machine Co.
Payne, G. W. & Co.

Rag Pickers.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Smith, Jas., Woolen Machinery Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
Horsburgh & Scott.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Walder, J.

Reels.
Luther, C. A. & Co.
North Chelmsford Machine Co.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

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Mason Regulator Co.
Walworth Mfg. Co.

Remnants.
Feingold, H. & D.

Ribbons.
Cheney Bros.

Ring Travelers.
National Ring Traveler Co.
Shaw, Victor, Ring Traveler Co.

Roofing.
Standard Paint Co.

Rope and Twine Machinery.
Haskell-Dawes Machine Co., The

Rope Transmissions.
Dodge Mfg. Co.

Roving Cans.
Hill, James, Mfg. Co.
Laminar Fibre Co.
Walrus Fibre Mfg. Co.

Rubber Covered Rollers and Goods.
Boston Belting Co.

Rubberoid Roofing.
Standard Paint Co.

Saddles and Stirrups.
Dixon Lubricating Saddle Co.

Scales.
Sweet & Doyle.

Scallop Machines.
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Schools.
Lowell Textile School.
New Bedford Textile School.
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Separators.
Draper Co., The

Sewing Machines and Supplies.
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Birch Bros. Co. (Somerville Mchn. Works).
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Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Somerville Machine W'ks, Birch Bros. Co.
Textile Finishing Machinery Co.
Willcox & Gibbs S. M. Co.

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Lupton's, David, Sons Co.

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——See Bobbins, Spools, Shuttles, Etc.

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Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A. & Co.

Singe Plates.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros. Co. (Somerville Mchn. Works).
Butterworth, H. W., Sons Co.
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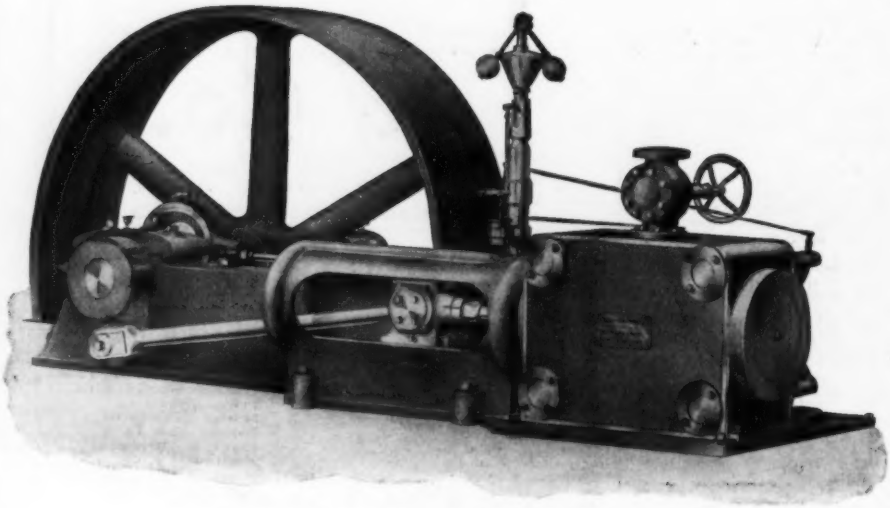

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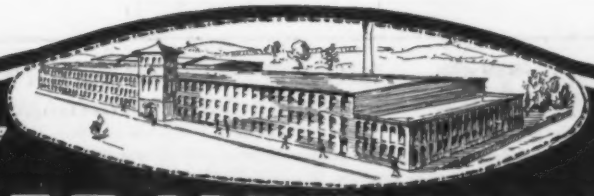

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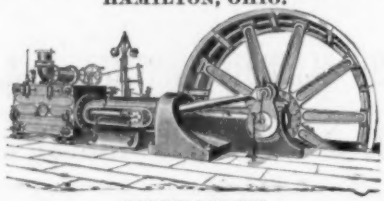

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Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin e and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. 3061, Textile World Record.

Boss Carder. Aged 28. Worked on plain goods. Will go South or anywhere. Steady man, and excellent references. Also a frame spinner. 1759, Textile World Record.

WOOLEN CARDERS.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2033, Textile World Record.

Carder, or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Carding and Spinning. Middle aged; English; married. Dress goods, flannels, blankets, overcoatings and plush goods. English and American makes of machinery, also an expert on the Bolette, 2079.

COTTON WEAVERS.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving. Accustomed to fancies. Can do own designing and figuring. Good references from past employers. Is open to go anywhere. Had experience on many kinds of looms, including the Draper. 1731, Textile World Record.

Overseer of Weaving in cotton mill. Worked on lawns, dimities, sheetings, corduroys, velveteens, etc. Colvin, Mason, Whitin, Kilburn & Lincoln, Knowles and Draper looms. 3011, Textile World Record.

Overseer of Weaving wants position. Practical experience from weaver, loom fixer, secondhand to overseer, on all kinds of looms and make of goods. References. Good manager of help. Married man; 35 years of age. 1806, Textile world Record

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings; plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference. 2019, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Weave Room, designer or assistant superintendent. Wide experience. Cassimeres, dress goods, blankets, flannels, etc. All patterns of Knowles & Crompton looms, Davis & Furber, spooling, dressing and weaving machinery, Worcester warp compressor. 1838, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

Overseer of ring spinning, spooling, warping and dressing. Will not go South. Middle aged; American; married. Good experience and references. 3059, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer Ring Spinning, Warping and Spooling. Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married. 1703, Textile World Record.

WOOLEN SPINNERS.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

Overseer Woolen Spinning. Is thoroughly competent to take charge of a large spinning room. 38 years old; French; married. Has spun yarns for flannels, tweeds and knit goods, also cotton and wool mixes, shoddies, ranging in all from 1/2 to 14 runs. Is familiar with Davis & Furber, Johnson & Bassett, Platt and other makes. Very satisfactory references. 1917, Textile World Record.

Worsted Spinner or Section Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay. 1709, Textile World Record.

Overseer of Ring or Frame Spinning, or would take superintendent position. Age 41; married. 2040, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer of Woolen Spinning. Age 44; American; married. Worked on cassimeres, flannels, tweeds and dress goods. Johnson & Bassett and Davis & Furber mules. Will not go West or South. Good experience and first-class recommendation. 3049, Textile World Record.

DYERS.

Boss Bleacher. Bags, shades, lawns, mercerized, Hollands, book cloth and table cloth. Prefers New York, New Jersey or Pennsylvania. 3083, Textile World Record.

Boss Dyer. Scotch; married. Wool, worsted, carpet and cotton yarn, piece goods, dress goods, raw stock. Will not go West, South or to Canada. Wants $3.50 or over. 3082, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton print goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

Foreman Dyer wants position. Age 27; English; married. Cotton and wool in raw stock, wool stock, cotton and worsted yarn and piece dyes, also hosiery. Will not go West or South. Good experience. 3079, Textile World Record.

Dyer. Age 33; Scotch; unmarried. Worked on every kind of woolen cloth, serges, meltons, shoddy worsted and woolen yarn, etc. Wants $3.50 per day. Will not go South. 3064, Textile World Record.

Dyer or chemist. A young man 26 years old; single. Cassimeres, dress goods, overcoatings, cloakings, etc. 3057, Textile World Record.

Superintendent or assistant of dye or bleach works. Age 35; English; married. Will not go to Canada. 3053, Textile World Record.

Boss Dyer. A young man; unmarried. Worked on knit goods, raw stock, dyeing wool and cotton. Refers to past employers. 3069, Textile World Record.

Dyer. Worked on all classes of goods, woolens, worsteds, yarn, piece dyes, slubbing, blue vats and cotton mixes. An American; married. 3085, Textile World Record.

FINISHERS.

Finisher of Cotton Goods, also worsteds, by calender, hot press and beetle, also understands frames, starching and mercerizing. Age 25; English. 3006, Textile World Record.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Cotton Finisher. Age 27. Worked on prints, lawns, dimities, muslins, ducks, drills, Madras, etc. Understands folding and packing. 3005, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Boss Finisher. Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

Boss Finisher in a woolen mill. Worked on kerseys, meltons, cassimeres, satinets, cheviots, etc. Wants $3.50 per day. Will not go to Canada or West. 3077, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

KNITTERS.

Foreman of Knitting Room, spring needle or flat knitting. Age 28. Fleeces of all kinds and gauges, balbriggan from 20 to 30 gauge, flat wool work all gauges. Is familiar with Tompkins Bros., Campbell & Clute and Crane machines. 3062, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

Boss Knitter. finisher or machinist. Worked on nearly all kinds of knit goods, and nearly all kinds of latch needle knitting machines and all kinds of machines used in finishing underwear. 889, Textile World Record.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record

Superintendent of knitting mill, or foreman in large plant, is open to position. Had some 15 years' experience as machinist, foreman and superintendent. Familiar with all grades seamless hosiery and most makes of seamless hosiery machinery. Understands business from starting new mills to finish. Perfectly sober and reliable. 3078, Textile World Record.

Superintendent or Foreman of seamless hosiery familiar with cotton and woolen goods on Scott & Williams, Electric, Acme, Standard and several other makes, ribbers, loopers, sewing machines, etc., is open to a position. 40 years old; American; married. Best of references. 1657, Textile World Record.

DESIGNERS.

Designer or assistant superintendent. Worsted dress goods, fancy cotton waistings, corduroys, worsted suitings. Wants place at once. Age 31; English; married. 3080, Textile World Record.

A First-Class Designer or superintendent desires position. Understands vestings, dress goods, silk labels, shoe facings, shoe straps, shirt labels and tapes of all descriptions. Large experience on Jacquard work. Age 26; single; English. Strictly temperate. 1773, Textile World Record.

Designer or Assistant Superintendent desires a position. 27 years old; Scotch; married. Familiar with all well known makes of machinery and with woolen, worsted and cotton goods. Good references. Will go to any part of the United States. Terms reasonable. 1996, Textile World Record.

Smart Designer, high class worsteds and coatings and trouserings. Thorough experience leading factory. Now abroad; anxious to find employment in this country. Moderate start. 1816, Textile World Record.

A Young Man, 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family. 1997, Textile World Record.

Assistant Designer on woolen or worsted dress goods and suitings is open to a position. Age 21; American; single. A graduate of one of the largest textile schools in the country, and has had experience in a good New England mill. Also understands flannels and satinets. Good references. 1923, Textile World Record.

MISCELLANEOUS.

Wanted, by a hard working, industrious man (English) a situation as fixer, second hand or overseer in tape mill. 1826, Textile World Record.

Loom Fixer. Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

Salesman for hosiery and underwear. Age 37, single. Can furnish references. 3060, Textile World Record.

Master Mechanic, or mechanical superintendent. Many years' experience in general machine work and mill engineering. References. 3067, Textile World Record.

Fixer of sewing machines. Is familiar with machinery of all kinds that is used in making up and finishing knit underwear. Will not go West or South. Wants place at once. References. 3068, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

Second Hand in cloth room desires position. At present has charge of samples in large mill. Has worked on all classes of cotton goods. Strictly temperate. 3048, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Asst. Superintendent. Young man, 26, graduate of Lowell Textile School (Woolen and Worsted Course). Has had considerable experience in setting up machinery, and worked in nearly every department of mill. Wants position in which there is a good chance to advance. 3040, Textile World Record.

Master Mechanic wishes position in the North. 35 years old; married. Worked 15 years on repairs. Wants $3.50 per day. Has license for running engines and boilers. Understands all kinds of water wheels and care of same, dynamos and electric lights and also gas houses, and a good knowledge of building, all kinds of wood work and piping and blacksmithing. Understands cotton mill repairs as good as the best man at such work. 2025, Textile World Record.

An Expert on soap making and wool scouring will be open to a position shortly. Is familiar with the treatment of all grades. About 40 years old; English; married. Has worked for one concern in the United States for 12 years. 1980, Textile World Record.

Paymaster or Bookkeeper. Agent or Manager wood or iron working plant or small cotton mill. 23 years' experience. Expert accountant. Can take charge of all the office work in large factory or do all myself in small factory. Good references. Will go anywhere in New England or Middle States. 1881, Textile World Record.

Overseer Colored Cloth Room. Age 48; American. 25 years' experience as secondhand. 1765, Textile World Record.

A Second-class Engineer, 48 years of age, American, would like a position as such in a N. E. mill. Is steady and reliable. Good references from former employers. 1965, Textile World Record.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

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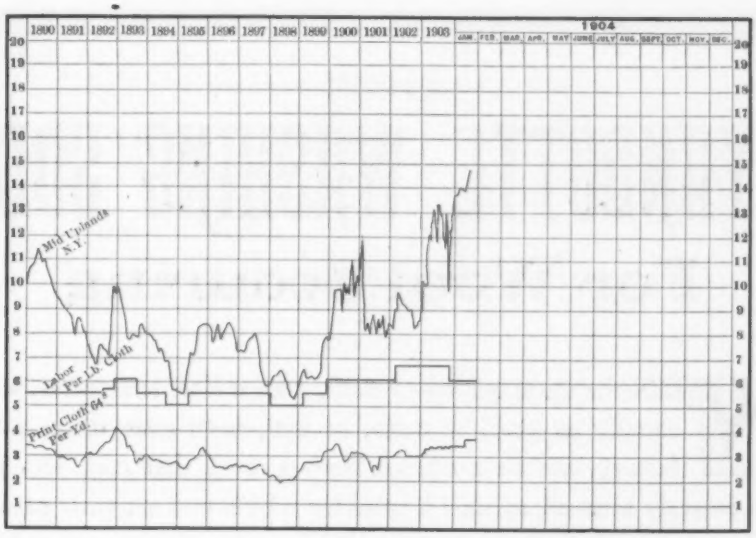

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Cotton at this writing is still soaring and the prediction that middling uplands would reach 15 cents has been fulfilled. The more enthusiastic bulls are expressing an opinion that a still higher level will be reached in the near future. Prices have reached a point where a pronounced reaction may naturally be looked for. While there is no question that the advance has a substantial foundation in the limited supply and the increased demand for the staple, yet it is also a fact that speculation and manipulation are important factors in the situation.

Cotton goods have been advanced in price for most grades and manufacturers have declined to make contracts even at the advanced price, owing to the condition of the raw cotton market. The advance in goods has been resisted strongly by buyers. Manufacturers, however, are placed in a position where the mills must be shut down or higher prices obtained for goods. It is a question of higher prices or bankruptcy and none of them hesitate long between the two alternatives.

Cotton has now been at a high level for a number of months, and during that time goods have shown but little disposition to advance. This has left the burden of the situation on the manufacturers and now that the goods market is responding to the advance in cotton the feeling is growing stronger among manufacturers that it will not be long before the goods market will be found on a level with the raw material, and thus enable the mills to manufacture goods at a profit from 12 or even 15-cent cotton. They will naturally welcome any relief from the strain of the last few months, whether that relief is obtained by a decline in the price of cotton or an advance in the price of goods. Goods having been advanced a readjustment of conditions in the jobbing and retailing trades will be necessary and very soon the consumer will find it necessary to either pay more for cotton goods or take a lower quality at the same price.

If raw cotton is to remain at the present price there is no question that the merchant and the consumer will adjust themselves to new conditions. As has been pointed out in these columns, an advance from 10 to 15 cents for raw cotton entails very little hardship on the consumer, amounting as it does to but little more than one dollar per year for each individual. This advance means an enormous increase in the amount received for cotton sold abroad, enough to more than balance the increase of cost to the domestic consumer.

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When you get results as above stated the question of cost in scouring is not considered. But when these results can positively be attained and at a less cost, then it becomes a matter well worth the investigation of every scourer of wool and woolen cloth.

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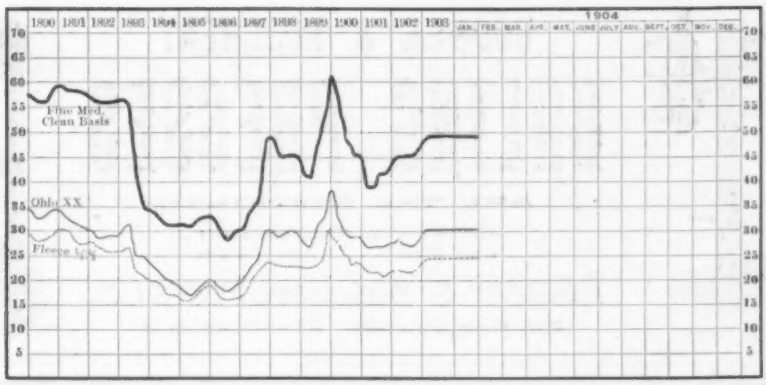

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

The general reduction in the price of woolen goods made by several large corporations has depressed the wool market materially. Sales have been small and while there has been no general cutting of prices it is a buyers' market. Manufacturers are buying wool very cautiously and only to cover immediate requirements. They ignore all arguments advanced by the wool dealer to support the theory that higher prices are coming, and are content to take the chances with empty storehouses, letting the present owners of wool pay the interest on the investment and enjoy the advantage that may result from the predicted rise.

The argument in favor of a higher price consists in the strong statistical position of wool throughout the world, the firmness of the London wool market and the moderate size of the stocks of wool at the seaboard. To offset these factors the manufacturers point to the near approach of the new clip which will begin to move in about six or eight weeks, the cutting of prices for goods and the fact that this is a presidential year.

Coarse wools are relatively stronger than the fine grades, but no indication of an advance can be discerned in any quarter.

English-Greene Co. Changes.

Messrs. English-Greene Co., the well known yarn and cloth commission merchants, with offices in Providence, New York and Philadelphia, announce that the location of their executive office has been changed from Providence to No. 43 Leonard St., New York City. The firm has been, in a measure, reorganized, and now consists of the following officers: J. H. English, president; H. E. Greene, treasurer, and C. T. Hindley, secretary. The Providence and Philadelphia offices will be maintained, the former as a cotton department under the management of E. X. Andem, and there will be no change in the latter, which in the past has been under the management of Benjamin Corbin. At the New York office Mr. English is looking after the yarns and Mr. Greene is in charge of the cloth department. All future telegrams and correspondence should be addressed to the New York office.

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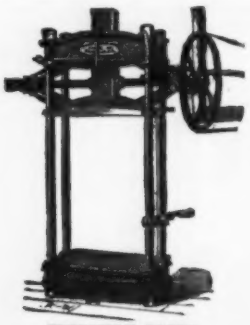

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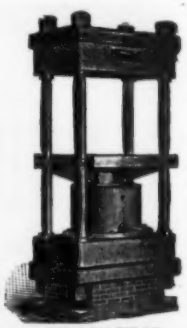

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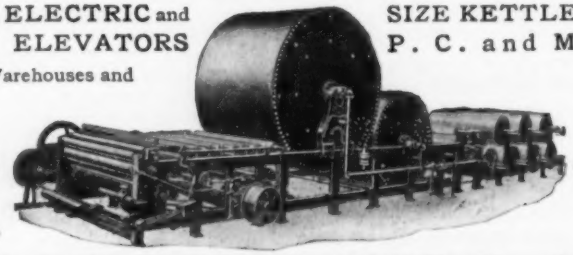

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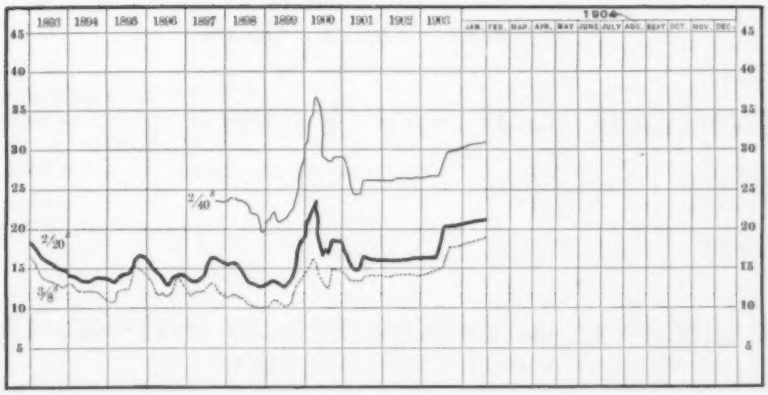


GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Cotton Yarn Market.

Business in the cotton yarn market has been brought to a practical standstill by the conditions in the market for the raw material. Both spinners and buyers are at a loss to know what is the proper course to pursue. The buyer is unwilling to order yarn at a price which the spinner must receive to avoid a loss. The goods market is much stronger and prices have advanced in some cases, but they are still far from being on a par with 15-cent cotton.

Everything hinges on the price of raw cotton and as it is beyond the reach of spinners, weavers, knitters and dealers in goods, all hands are watching it as they would watch a balloon soaring far above them; they are wondering if it is going still higher or if it is coming down to the ground where they can reach it; none of them know anything about what it is going to do.

There is no question but the situation is very critical for cotton manufacturers, as very few of them have purchased cotton at a low price to cover their production. Many of them will be forced to shut down their mills unless the price of goods advances sharply. The stock of yarn is not large and further curtailment of production will contribute to the much desired advance in yarn prices. Quotations are purely nominal as there is no basis on which the trade can depend from day to day.

We quote as follows:

Eastern Cops.

6's	22¼
8's	22¾
10's	23¼
14's	24¼
16's	25
22's	26½
24's	27
26's	27½
30's	28½
34's	29½
36's	30½
40's	31½

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	25
14's	25½
18's	26½
20's	27
22's	27½
26's	28½
28's	29½
30's	30½
36's	32½
40's	34
45's	37
50's	39
55's	43
60's	49

Eastern Two-Ply Warps, Carded Peeler.

2/30's	30½-31
2/36's	32½-33
2/40's	34-35
2/45's	37-38
2/50's	39-40
2/60's	49-50

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	37
35's	38
40's	40
45's	43
50's	45
55's	51
60's	55½
70's	59½

Two and Three Ply Skeins, Combed.

30's	38
36's	40

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

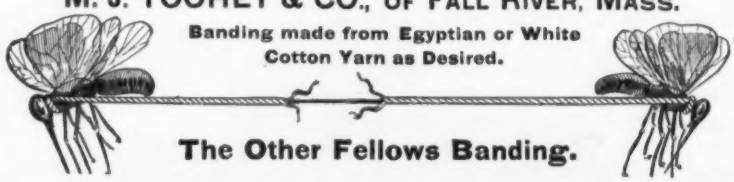
Colored and Bleached Yarns Furnished In any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

40's	42
45's	48
50's	53
55's	56
60's	59
70's	66

Philadelphia Market.

The yarn situation is more puzzling than ever. Prices keep going up and up, making new records every few days. Some lines of business have been forced almost to a standstill by the sharp advance in cotton and yarn. Prices on manufactured goods are not following the course of the yarn market, and the advance has been so big as to wipe out the profit of most of the lines of cotton goods. The only mills that are busy are those that were fortunate enough to have yarn bought at low prices and on this account they are in position to sell goods at prices which jobbers are willing to pay.

The cotton manufacturing industries are facing the most serious situation that has arisen in a good many years. There are so many influences and conditions to be met that it is useless to predict what the future will bring forth. There are a sufficient number of mills curtailing production at present to affect the market adversely, in ordinary times, but so far the curtailment of production has not had any effect of lowering prices on yarn, and probably will not in the immediate future.

Spinners as a rule are not sold far ahead. Neither are they covered for cotton for any length of time. It is reported that here are only two mills in South Carolina that have covered on cotton at low price, for the entire season. Any mill that has to buy cotton today certainly cannot afford to cut the present market on yarn.

We quote the following prices, but would say, while these quotations represent the market today, they may not be an index of the situation in a week or two from now. We have had many instances recently where there was a difference of 1c. to 1 1/2c. per pound between the buyer and the spinner, which indicates a wild and uncertain market.

Southern frame cones (good quality):—

7's and coarser	22-22½
8's and 9's	22½-22¾
10's	23
12's	23½
14's	24
16's	24½
18's	25
20's	25½
22's	26
24's	26½
26's	27

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Successors to BUCKINGHAM, PAULSON & CO.
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302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

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122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Yarns.
67 CHAUNCY STREET, BOSTON.
216 CHURCH STREET, NEW YORK.
206 CHESTNUT STREET, PHILADELPHIA.

Ballou Yarn Co.
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GASSED .·. YARN .·. SPECIALTIES

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With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.
Ramie Yarns for Knitting or Weaving.

J. S. DODDS,
346 Broadway, N. Y. Life Bldg., New York, N. Y.
MERCERIZED YARNS
Two and Three Ply, for all purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk. Mercerized, Turkey-Red, Embroidery Yarns.
109 GREENE ST., NEW YORK.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

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MANUFACTURERS OF

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Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

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Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPIA.

FIRE HOSE CORDS From long staple cotton—6s to 20s yarn in 2 to 100 ply—16 lbs. without a knot.

COTTON WARPS On beams—single or ply yarns, grey, bleached or colored.

GLAZED YARNS All plys—any color—for braiders, harness and sewing threads.

UNIVERSAL WIND For braider cops—warp yarns—grey or colored—2 inch to 12 inch traverse.

Dyeing facilities are new and best quality work guaranteed. We are prepared to dye yarns for other parties.

WHITTIER MILLS, Chattahoochee, Fulton County, Ga.

Indian Orchard Company.
Cotton Warps and Yarns.
In Gray and all Colors, Single or Two or more Ply and Cable Cord.
Novelty Yarns.
in Various Patterns, Colors and Twists.
Carded and Colored Cotton.
For Mixing with wool, Machined or in Roving.
Indian Orchard, Mass.

30's	28
40's	33
50's	38

Southern high grade mule yarn:—

Cones.

10's	23½-24
12's	24-24½
14's	24½-25
16's	25-25½
18's	25½-26
20's and 22's	26-27
24's	27-27½

Southern frame yarn, lower grades:—

6's and 8's	21
10's	22

Eastern cones (high grade quality):—

10's	24½
12's	25
14's	25½
16's	26
18's	26½
20's and 22's	27-28

Skein yarn (mostly Southern):—

4's to 8's soft	21½-22
10's to 12's	22½-23
14's to 20's	23-24
22's	24½
14/2	23½-24
16/2	24-24½
20/2	24½-25
30/2	27½-28
40/2	34
16/3 slack	23½-24
12/3 slack	23
8/3 carpet	21
8/3 slack	21
9/4 slack	21

Warps (mostly Southern):—

10's to 12's	23-23½
14's	23½-24
16's	24-24½
20's to 22's	24-25
26's	25-25½
14/2	24
16/2	24½
20/2	24½-25
24/2	26-26½
30/2	27½-28
40/2	34

Mixed colored yarns (mock twist, half colors):—

6's to 10's	24
12's to 14's	25-26
16's to 18's	27-28

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white

Egyptian, 4c. to 5c. above best quality white.

A Large Belt.

The J. S. Turner Mfg. Co. of Lowell, Mass., have lately installed new machinery for belting and leather working. They have recently made a belt for the Moore Spinning Co., North Chelmsford, Mass., 36 inches double, 94 feet long.

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

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Commission Merchant,
COTTON YARNS OF EVERY DESCRIPTION.
114 Chestnut St., Philadelphia.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

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Skein, Warps, Cones, Cops, Tubes
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Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

Walcott & Campbell Spinning Co.
Fancy Hosiery Yarns
IN ALL COLORS
New York Mills, Oneida Co., New York

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Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

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Worsted Yarns.

OFFICES:
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Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

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SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

TRADE MARK
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YARNS
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ENGLISH-GREENE CO.

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72 Leonard St., New York.
300 Chestnut St., Phila.
Consignments Solicited for Southern Mills. Liberal Advances Made and Sales Cashed Promptly.

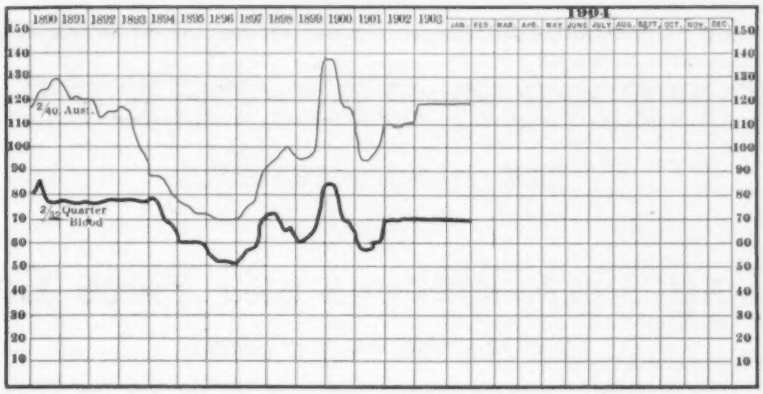

CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

Worsted Yarn.

Spinners of Bradford yarn are not getting orders sufficient to run machinery. The weaving trade has placed no orders as they are waiting for the heavy weight season to develop. This may change for the better any time. This state of affairs is most disappointing to all spinners as the cold weather should have started buying early. The prices being secured by the spinners for yarn have been far from satisfactory. Yarn is either at a parity with the price of yarn before the advance one year ago or is lower. In some instances the prices are very much lower than the asking prices last year. The weaver seems to set the price on certain kinds of Bradford spun yarn and although the prices show a loss, spinners accept them.

While the price of yarn is lower than one year ago the cost of worsted wool is higher and such wool is hard to get hold of at any price. Though the spinners are accepting yarn orders at a loss, they are hungry to get 1/4 to 3/8 blood wool at two cents per grease pound over one year ago. The only solution of the problem is that spinners will accept orders until all are assured enough business to keep a part of their machinery going and then prices will advance to meet increased cost of wool. The weavers who have been wise enough to place orders early will get the benefit of low prices, while the others will pay an advance.

Weavers generally have not placed orders but are waiting for the heavy weight business to develop before buying yarn. The outlook does not encourage them. Piece dye worsteds have already

SILK NOILS AND SILK NOIL YARNS
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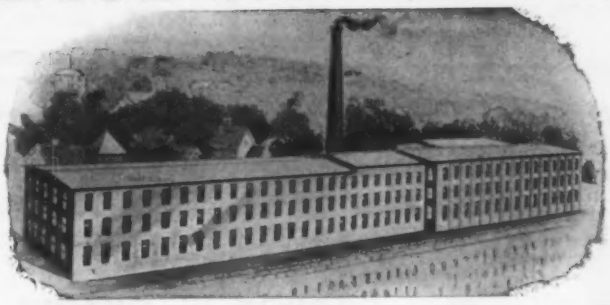
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.
MOHAIR TOPS AND YARNS FOR WEAVING
LUSTRE YARNS FOR SERGE LININGS
ALPACA YARNS

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KNITTING YARNS
WORSTED YARNS
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MANFRS. OF Sons & Co.,
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French System. Bradford System.

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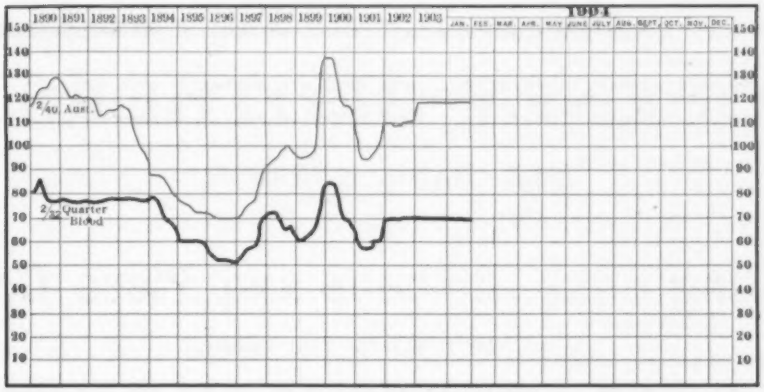

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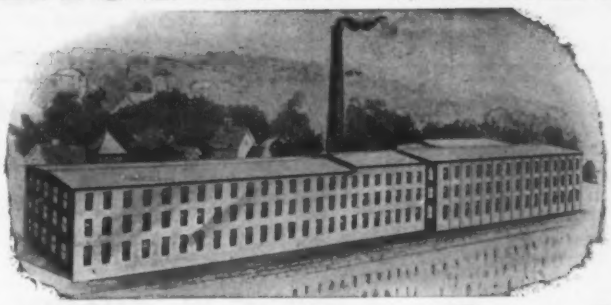

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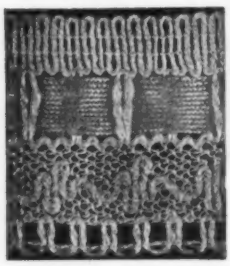

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BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. TAPES Common, Twilled, Superfine and plain 13 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. THREADS on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS. Latest Styles in Pant Laces.

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opened up at greatly reduced prices, but there is certainly an explanation for this. Clay worsteds, which certain large weaving mills are especially fitted up to make, have gone out of style. These mills are best fitted to make piece dyed cloth which can be made from a medium grade of yarn. These mills are trying to popularize this cloth by making low prices. The other weavers with smaller plants realize the impossibility of manufacturing this class of cloth at the prices set and have turned their attention to other fabrics and styles.

The fancy worsteds have not yet been opened, and the time of opening is set for about February 15th. Some orders have already come to hand, but not in sufficient quantities to warrant much buying on the part of the weavers. Said one weaver: "We have got out part of our line and expect to complete it by the last of January, when we expect to secure orders. We shall place no orders for yarn until we know what our requirements are to be. The yarns to be used largely the coming season are 1/4 to 3/8 blood quality, the wool of which is highest in price. The sizes will run from 2/20's to 2/26's, 2/30's to 2/36's, and there will be some half blood yarn in 2/40's and 2/30's used.

Cotton worsteds are no longer a factor in the men's wear weaving trade. The radical and continued advance of cotton yarn has caused wild fluctuations in the quotations for yarn. Buyers as well as weavers are leaving this cloth alone and this condition will aid the worsted spinner before the season is over.

The men's wear heavy weight business is starting later, but a good season is ahead, provided yarn prices can be maintained at the present level. If spinners try to force an advance, business will be brought to a standstill. The French spinners have been more fortunate than the English spinners and been booking some good orders, largely from the hosiery manufacturers for delivery during the season to July 1st.

Most of the yarn bought has ranged in size from 1/18's, 1/20's, 1/28's, 1/30's, 1/36's, 1/40's and 1/45's,

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
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GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND WARPS
FITCHBURG, MASS.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

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COMBED and CARDED
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From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
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Diamond Stay Bindings TRADE MARK
Manufacturers of
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

Neverstink
SOMETHING NEW
Prevents Woolen Goods from Shrinking
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Charles H. Heyer
BUSTLETON, ... PENN.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
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EATON RAPIDS, MICH.

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Carpet Backing and Rug Yarns a Specialty.
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Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
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Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
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Peeler, Egyptian, Mixed Colors.
Large Assortment.
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SHODDY WM. H. H. SLACK & BRO., Springfield, Vt.
Carbonized Stock a Specialty. **FLOCKS**

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ED. GLUECK, Sec. and Gen. Mgr.
RIVERDALE WOOLEN CO., MANUFACTURERS OF
.. Shoddies ..
Of every description. Capacity 7,000,000 pounds per annum.
Custom Carbonizing and Garnetting a Speciality.
New York Office.
140 DUANE STREET. RIVERDALE, NORTHBRIDGE, MASS.

mostly of a medium grade, about half blood quality.

The hosiery manufacturers have better prospects for good business on cashmere hosiery than has been the case for some years. This is caused by the great advance in cotton yarn.

The underwear manufacturers, although in the market, have not as yet ordered largely of yarn, but will do so within the next two or three weeks.

Dress goods manufacturers are ordering quantities of 2/50's hard twisted yarn, and those weavers who ordered yarn for rain cloth are trying to cancel orders as the fad has evidently not lasted. The better and finer grades of yarn are being maintained in price, also the lower grades. The medium grades are not advancing and are being largely called for by manufacturers in consequence.

The orders for dress goods have not begun to come forward freely as yet for next season but these people are making inquiries for yarn and will be buying within the next three or four weeks from Jan 15th. This applies only to staple yarns, as some orders have been placed for novelties, but in this line weavers only will cover for actual requirements on account of styles changing so quickly.

The bunting trade continues in fair volume, but weavers are not placing orders, as much yarn was carried over. Weavers concede higher prices for quarter blood wool, but claim it will not affect the price of yarn. They say if it does they will pay the advance rather than take a chance on the present market. Fine tops and coarse tops have advanced. Wool is firm and combers are not busy. This is likely to change at any time.

We quote:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ⅜ Blood	.75
2/26's ¼ Blood	.68

Woolen Yarn

Spinners are well employed and have secured business which will run them until September. This applies mostly to those spinners who are doing commission spinning. The demand has come from all branches of the industry. Those manufacturers who find their machinery unbalanced by the loss of demand for worsted cloth, are using this yarn for filling and the backing of heavy weight cloth, also for twisting with worsted thread to get a fancy twist at small cost. The dress goods manufacturers continue to buy woolen yarn, and the manufacturers of eiderdown and French flannels

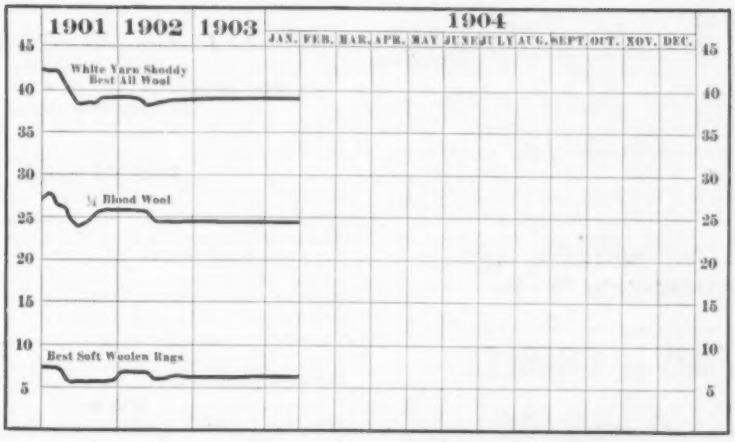

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

are employing much machinery outside their own mills.

The hosiery manufacturers will use much woolen spun yarn the coming season, and largely percentage yarn in place of all wool yarn. Some large orders have been given to spinners of sale yarn in this direction. The sale yarn spinners are not all sold up, but are getting orders from time to time which will soon take care of the entire product of their mills and some of the late ones will have trouble in getting satisfactory delivery.

The price of cotton is a serious problem with spinners, as the price on Peruvian cotton has advanced 5 cents over last year and domestic cotton has advanced 6 cents per pound. Fortunately wool is not so high as one year ago and spinners have been able to equalize matters so that the price has been made about the same as last year. It is certain that fleece lined cotton underwear will not be sold to take the place of wool underwear this year, and it is well that this is so, because much of the sickness this cold winter can be traced to the consumer of underwear, who buys a shirt for 35 cts. and believes it will keep him as warm as a wool garment costing much more. The consequence is that when severe weather is experienced the wearer has no protection whatever. It is believed that these cheap garments will be less used during the winter seasons. Certainly many of these mills are not run on this class of underwear at the present time. The mills are not well supplied with material and are buying both yarn and material from hand to mouth. Fine wools are scarce, and are hard to secure. There is plenty of poor wool for sale, but nice, straight, fine wool is not plentiful. There are many manufacturers using silk noils and these noils are having a good run.

Thread waste (imported Australian) is in good demand and many knitters are using it in connection with Australian wool. Australian thread waste is selling for 55 to 60 cts. Australian lambs' wool is going to be more extensively used the coming season than was the case last year. The price will range from 73 to 75 cts. per pound.

Rag and Shoddy Market.

Conditions have slightly improved in the rag and shoddy market since our last writing, due to the heavy weight season and also to the reduction in the price of goods, which has made it necessary for manufacturers to search for lower priced wool stock with which to meet the demands made upon them for lower priced goods. The mills are buying cautiously and none of them are placing orders beyond what is necessary to cover the orders they have received for goods.

Shoddy mills are fairly busy filling orders for early delivery and it is the general opinion that this hand-to-mouth policy will prevail throughout the trade for remainder of the season. Cotton waste has fluctuated with the raw cotton market and most dealers decline to make quotations for more than a day at a time. New clips have been strong, due to the limited supply caused by the dullness in the cutting rooms. We quote as follows:

COTTON WASTE.

No. 1 Spinners	12½-13
No. 1 Machine	7½-8
No. 2 Machine	6-6¾
Machine Cop	8-8¼
No. 1 Cop	9-9½
No. 1 Card	11¾-12¼
No. 2 Card	10¼-11¼
No. 1 Oily Card	5½-6
No. 2 Oily Card	4-4½
Egyptian Card	None in the market
Peeler Combing	13¼-13¾
Egyptian Combing (scarce)	None in the market

Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

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Amsterdam, N. Y.
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COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

No. 1 Linters	7-7½
No. 2 Linters	6½-7
White Clips	8¾-9¼
Colored Clips	5½-6½
No. 1 Picker	2-3½
NOILS.	
Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26
SHODDIES AND EXTRACTS.	
White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Merino.	
Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14
DELAINE EXTRACTS.	
Light	19-22
Medium light	15-17
WOOLEN RAGS.	
Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8
Worsteds.	
Blue	16-18
Black	18-20
We quote as follows:	
Serges.	
New black	15-16
New blue	14-15
Flannels.	
New scarlet	18½-22
New blue	17-18
Cloakings	3-4
SOFTS AND KNIT STOCK.	
Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14
Merinos.	
Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	5-6½
Coarse dark	4-4½
Blue	12-13
Blue—seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8
FLOCKS.	
Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

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Dyers and Finishers of Dress Goods, Men's Wear and Cloakings, such as Venetians, Armures, Soleils, Crepons, also Silk Warp Fabrics, Cotton Warp Linings, Suitings, Clays, Serges, Worsted Damasks, Tapestries and Shirtings.

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BLEACHING, DYEING and MERCERIZING of all grades of Cotton Yarn,

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Also Dyers of Turkey Reds and Indigo Blues for all purposes in either Warp or Skein.
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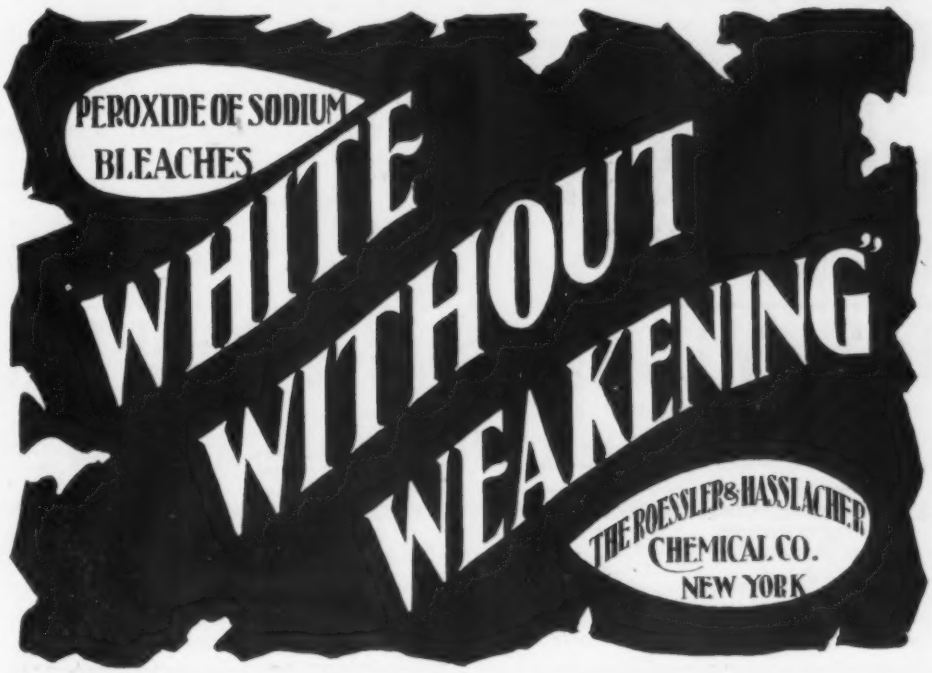
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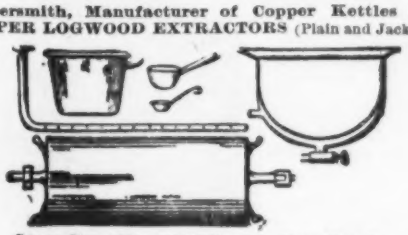

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Oxidizing, Lisleing and Chroming Machines, Tom-Toms, Bleaching Kiers, Tanks, Vats, etc.
Formulas sold for "Sanitary" Fast Black Colors and Bleaching.

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Drying and Sulphur House Poles of Natural Round Water Grown Cedar for Cotton, Wool, etc. Special Hardwoods in Standard No. 1 and "Selects" without knots, grades, for Silk Dyeing. Manufactured by, prices and all information from

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NORWOOD ENGINEERING COMPANY,

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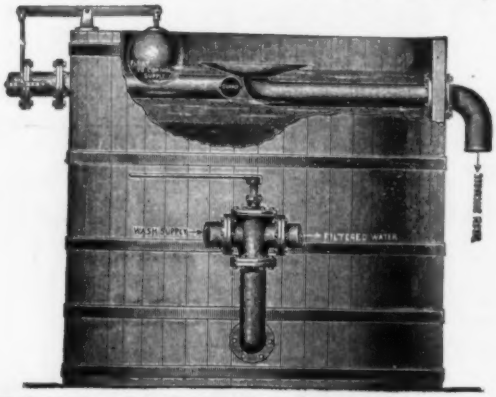

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Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

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Copper Printing Rollers, Singe Plates and Sheets.

OUR GUARANTEE: { Superior Quality. Prompt Shipments.

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YOU CAN'T BEAT OR BREAK IT. Send for sample and if not satisfactory can be returned at our expense. Look at the STEEL POINTS. Write for Prices. Manufactured by

CITY FORGE & IRON WORKS,

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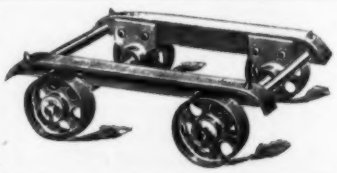

We Build the Best

STEEL TOWERS AND TANKS

For Fire Protection.

DYE TUBS, VATS AND TANKS FOR EVERY PURPOSE.
DRAW LUGS FOR TANK HOOPS.

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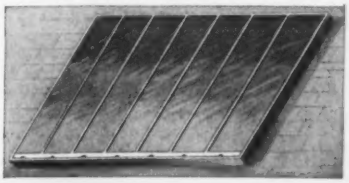
Patented Metal Window Frames and Sashes.

Positively Prevent Fire From Entering Building. Suitable for Office and Factory. Insurance Reduced to a Minimum. Quick Shipments Guaranteed. Illustrated Catalogue Free.



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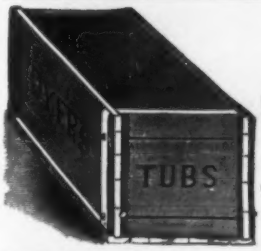
DAVID LUPTON'S SONS CO., PHILADELPHIA. NEW YORK.



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Manufacturers of

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2915-2933 North Second Street,

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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.

Down Town Office, 140 Chestnut Street, Corner Second.

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"Absolutely Safe and Reliable. Ask Your Friends."

A Gallon of Water

Weighs over eight pounds. What a risk you run by having a water tank on the roof of your factory. If it burst or fell it would result in great damage to your building and contents. Avoid danger and save money by placing your tank on a

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Your water supply will be improved and the pressure increased.

May we send our catalogue pricing these outfits?

W. E. CALDWELL CO.,

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BARNEY VENTILATING FAN WORKS

ALBERT B. FRANKLIN, PROPRIETOR

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165-7 FORT HILL SQUARE
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Compound Fans

For Removal of DUST, HEAT, ODORS, STEAM, SMOKE, MOISTURE AND GASES, AND FOR ALL SORTS OF . . . . . .

VENTILATION

MILLS, DYE HOUSES, SCHOOLS, THEATRES, ETC.

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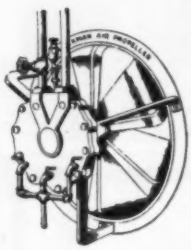
With Direct Connected Engines.



ECONOMICAL FIRST COST OPERATION

Can be run at any speed and any time. No long shafting and belts to waste power.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

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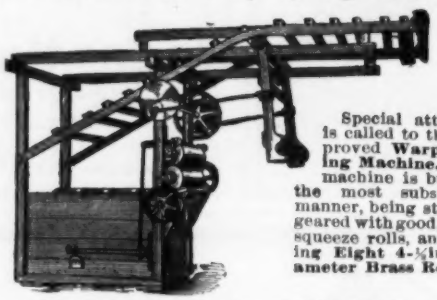
Write for particulars.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-¼in. Diameter Brass Rolls.**

This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,

Hedge and Brown Streets, FRANKFORD, PHILA.

THE G. DROUVÉ CO.

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Manufacturers and Erectors of

SHEET METAL ARCHITECTURAL WORK.

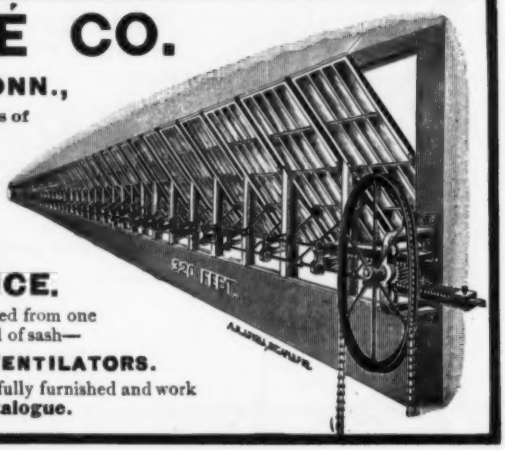
Sole Manufacturers of

THE LOVELL WINDOW AND SHUTTER OPENING DEVICE.

A line of sash 500 feet long can be operated from one station if desired. Adapted to any kind of sash—

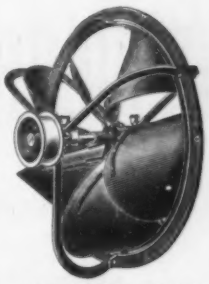
SKYLIGHTS, CORNICES, VENTILATORS.

Correspondence solicited. Estimates cheerfully furnished and work guaranteed. **Send for Catalogue.**



We Admit it IS Remarkable

But every word in our new circular about the Berry System applied to Cloth Dryers, etc. is backed up by the mill owners' own statements. Many of these men did not realize that they were not getting the best possible results. You may be in an equally contented frame of mind. If you do not want to be disturbed from your quiet repose, better not read the circular, for it will make you uneasy in your mind until you have found out what we can do with YOUR dryer.



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DIXON'S SOLID CRAYONS

give clear marks which disappear during bleaching without special erasure. The standard of mill men for many years. Paper covered, requiring no sharpening, in lengths of 7 or 3½ in.

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Perforated Copper

For Wool Scouring, Renser Boxes, Dyeing of Raw Cotton. Duster Screens, Picker Screens.

PERFORATED SCREENS OF ALL KINDS.

Factory, Carwood, New Jersey.

THE CYPRESS LUMBER CO.

TWO BIG FACTORIES.

TANKS

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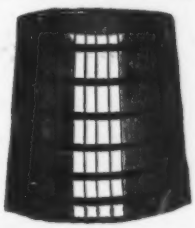

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60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
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} EFFICIENT DURABLE LOW IN PRICE

JOHN W. FERGUSON,

Builder and General Contractor.

MILL BUILDING A SPECIALTY. References made to some of the largest mill owners in the Middle States, including Clark thread Co., Newark, N. J., Barbour Flax Spinning Co., Paterson, N. J., and others.

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ARE YOU IN NEED OF CUTS

IF SO, NOTIFY—

Smith Bros.

WOOD, ZINC & HALF-TONE ENGRAVING.
KNITTING MACHINERY & ALL KIND OF MECHANICAL WORK OUR SPECIALITY.
119 S. 4th Street
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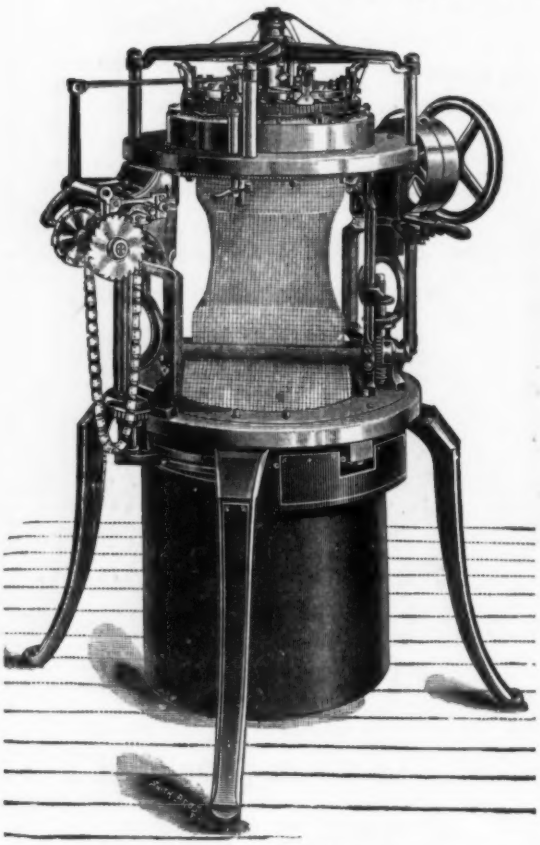
McMICHAEL & WILDMAN MFG. CO.

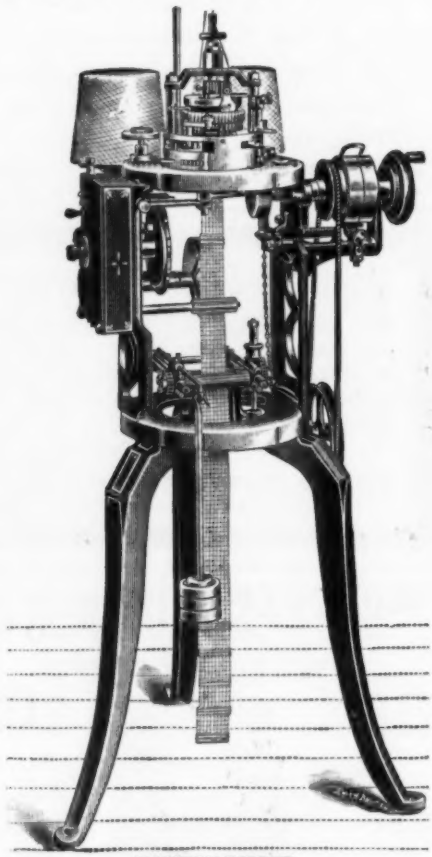
CIRCULAR RIB KNITTING MACHINERY

AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

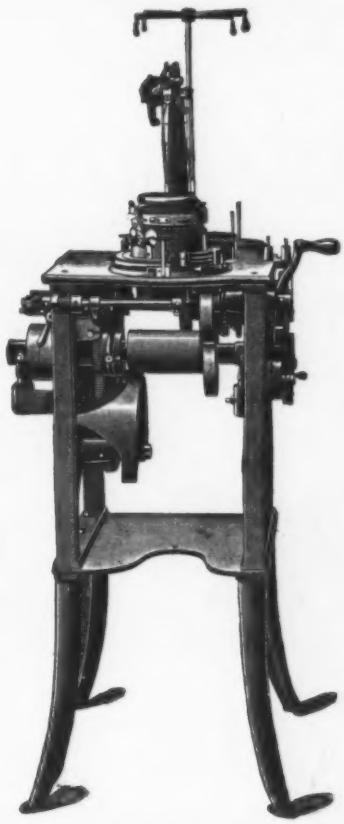
Full Particulars, Description and Samples Furnished upon Application to the

McMICHAEL & WILDMAN MFG. CO.

NORRISTOWN, PENN.

Acme Automatic Knitter

FOR SEAMLESS HOSIERY



ALL KINDS AND GAUGES

Best method of transferring ribbed legs and tops.

Greatest production of perfect work at least cost.

All latest attachments and improvements.

Our new type of machine, just out, having absolutely positive feed on pattern mechanism, which is set by dial, and graduated disc when changing styles and sizes, is one of the greatest improvements in knitting machines for a long time.

For particulars address

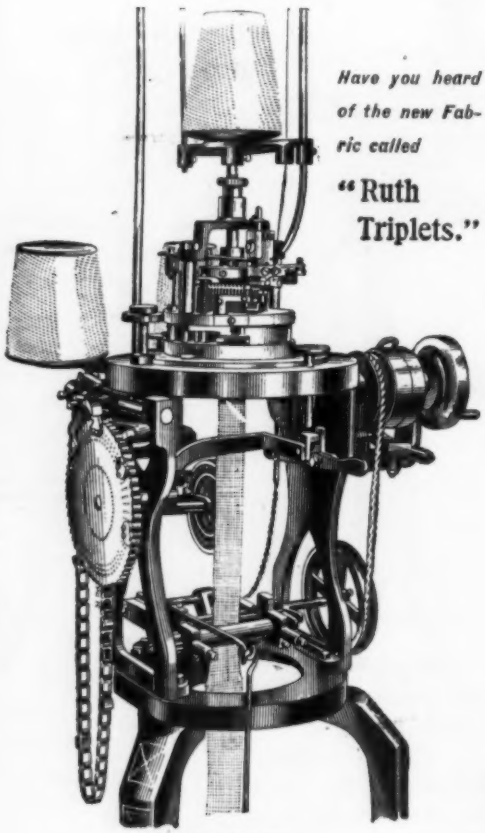
MAYO KNITTING MACHINE & NEEDLE CO., FRANKLIN FALLS, N. H.

Philadelphia Office: Knickerbocker Building, Cor. 6th and Arch Sts.

We manufacture all kinds of Latch Needles of superior quality.

START 1904 RIGHT

"Once Used, Never Without,"
Applies to all RUTH Products



Have you heard of the new Fabric called

"Ruth Triplets."

Install

RUTH

RIBBERS
in your mill.

Every machine guaranteed to do all for which it is constructed. Why hesitate?

Use the

RUTH

SPECIAL
NEEDLES

WE WISH YOU A VERY HAPPY AND PROSPEROUS NEW YEAR.

PATENTEES AND MANUFACTURERS OF

Ruth Ribber, Ruth Sleever, Ruth Splicer, Ruth Automatic Stop Motion, Ruth Lace Device, Ruth Friction Pulley, Ruth Belt Shift, Ruth Needles.

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Get our prices before placing your order for ANY PART of ANY MAKE of Knitting machines.

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Having large stock of

COTTON YARNS

in their warehouses are in a position
to make and

GUARANTEE

DELIVERY AS DESIRED ON ALL

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The "INVINCIBLE"

A machine of the highest grade.

Practical and Economical in operation.

A Big Producer.

Gauge of machine changed by simple changing cylinders.

The Invincible METHOD OF TRANSFERRING RIBBED TOPS is quicker and more positive than others.

No experience required to transfer ribbed tops by this method.

YARN CHANGED automatically without revolving bobbins.

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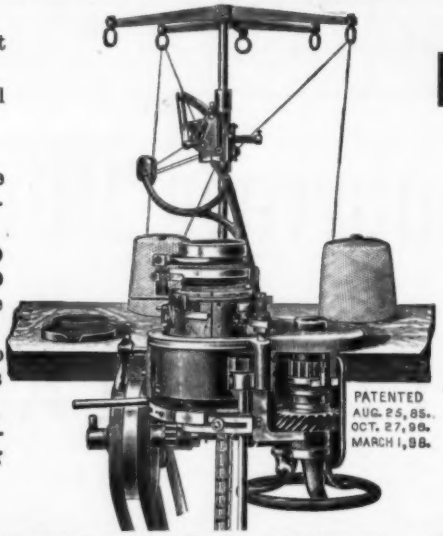

Full Automatic Knitting Machine

For all kinds and gauges of

SEAMLESS HOSIERY

PAWTUCKET, R.I. U. S. A.

E. JENCKES MFG. CO.

BRANCH OFFICE, Room 370, Bourse Bld'g. PHILADA, PA.

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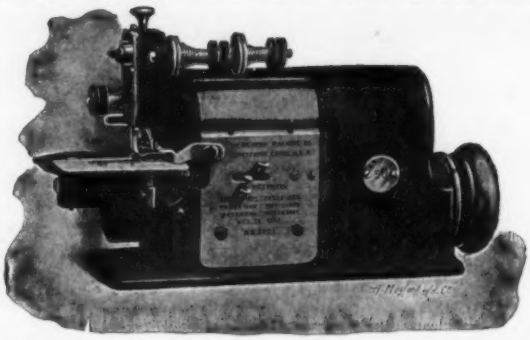
THE CHEAPEST and BEST METHOD OF

FINISHING RIBBED KNIT GOODS

IS BY THE USE OF

OUR HIGH SPEED MACHINES.



BLANKETS, SKIRTS or COTTON GOODS,

requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.

Send for Catalogue and Samples, stating the kind of goods to be finished.

THE MERROW MACHINE CO.,

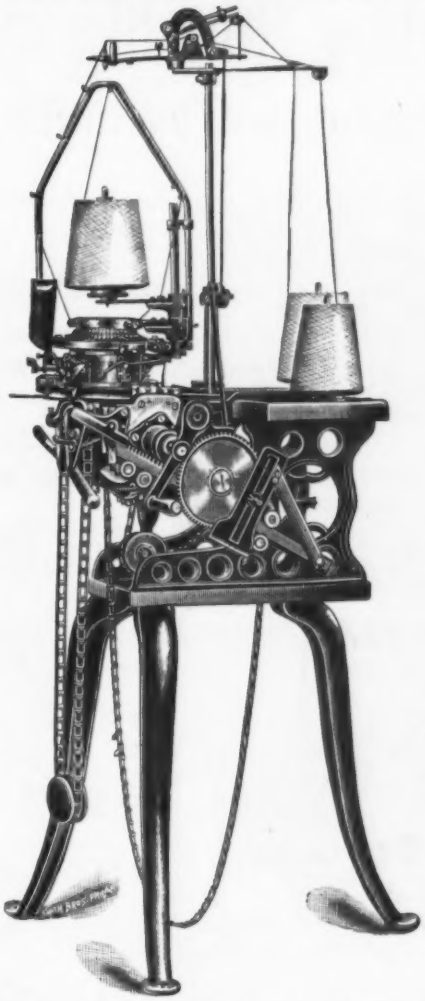
346 Broadway, New York. HARTFORD, CONN. Bourse Bldg., Phila.

EXCELSIOR

Knitting Machine Mfg. Co.

BUILDERS OF

KNITTING MACHINERY



Two-Feed 7-8 Automatic for Ladies String Work, also Black Legs with White Feet.

Regular 7-8 Automatic for all classes of Cotton Hose. Special 3-4 Automatic for Wool.

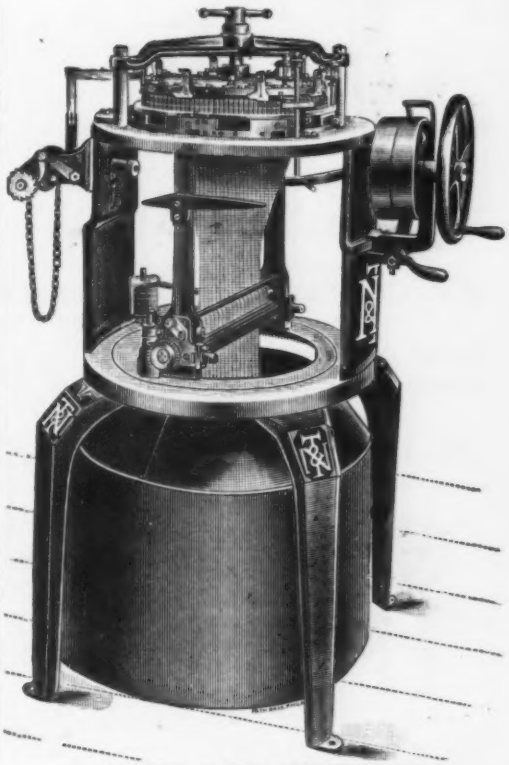
Allentown, Pa., U. S. A.

NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



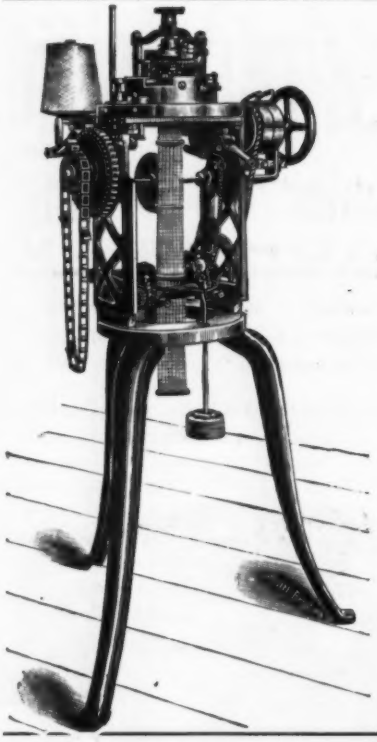
LATEST IMPROVEMENTS

QUALITY OF FABRICS AND PRODUCTION

UNEXCELLED

NYE & TREDICK CO.

606 Arch St., PHILADELPHIA, PA.



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213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

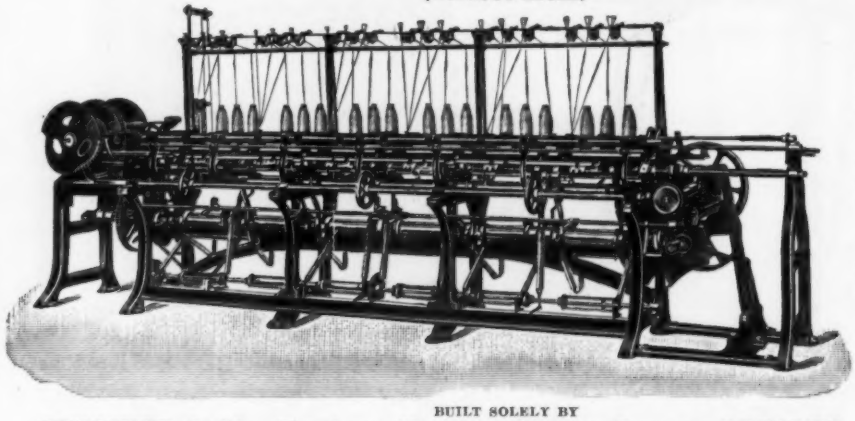
The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

WALTER SCHOEBEL, 110 Penn St., BROOKLYN, N.Y.

SOLE AGENT FOR THE UNITED STATES FOR

NEW The "Record Narrowing" Flat Knitting Machine NEW

(WITHOUT LOCKS)



The "Record" excludes any breaking of needles.

The "Record" runs very lightly and with the greatest quietness.

The "Record" narrows after a new method.

HIGH PRODUCTION.

BUILT SOLELY BY

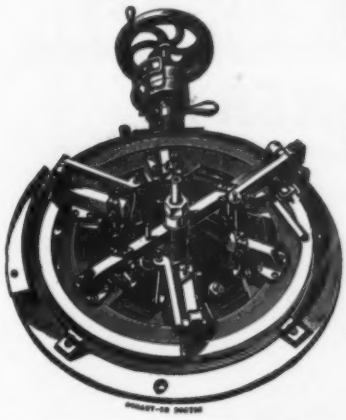
IRMSCHER & CO., Dresdener Knitting Machine Factory, DRESDEN, SAXONY.

This new invention, working after an entirely new method, is a combination of the COTTON and FLAT Knitting Machine with Automatic Narrowing Apparatus, for the production of full fashioned goods, seamless legs of ladies' hose, plain, seamless drawers, Shaker and cardigan sleeves, etc.

"THE RECORD" is also built without narrowing attachment for making 2 and 2 ladies' vests, shaker bodies, sweaters in 1 and 1 half and full cardigan, rib tops, etc.

All goods produced on the "Record" have more elasticity and are of finer manufacture than any other machine of its kind.

SPECIAL HAND AND POWER MACHINERY FOR FANCY GLOVES, SWEATERS, GOLF HOSE, LADIES' BLOUSES, ETC.



CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

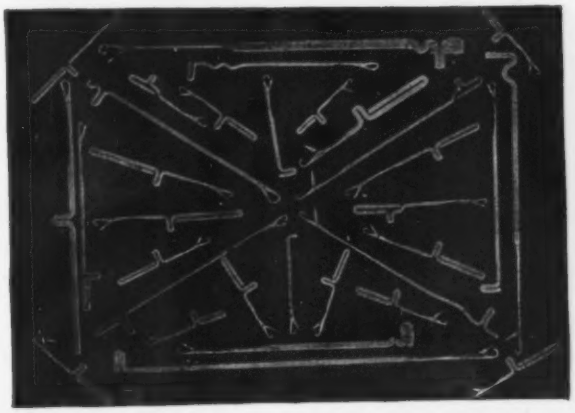
The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.



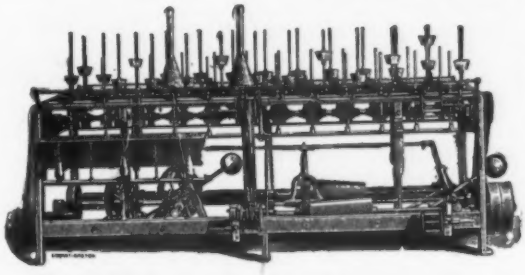
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

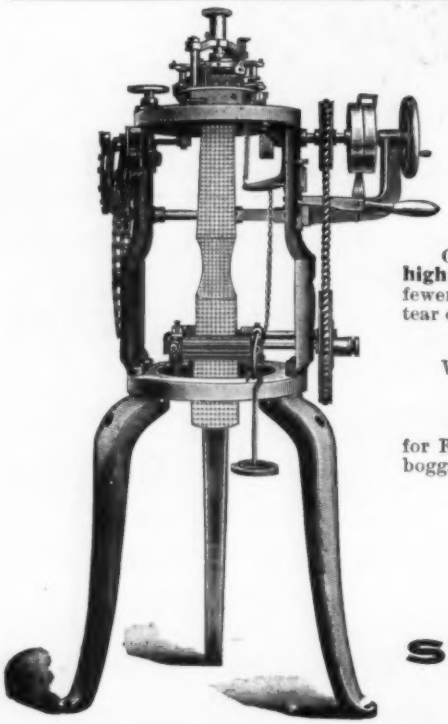
OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

50 New Victors, various sizes.
28 Beattie & Hepworth loopers.
3 Cornely embroidery machines.
10 Hosiery presses (Lever).
3 Screw presses.
2 Hollow plate presses.
40 Lamb and Grosser flat knitters.
150 Ribbed underwear machines, various sizes and makes.
1 Speed lathe.
1 Sensitive drill.
60 Brinton & Co. 3¾ aut. knitters, sizes.
27 Standard A machines, 3¾ in., 160 needles.
56 Union Special machines.
100 Brooks welters.
98 Brinton & Co. and other make hosiery ribbers.
Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 Payne winder, 40 spindle.
50 National spring needle machines.
1 Sandusky mangle, 60 inch.
1 250 doz. Cyclone hosiery dryer.
1 20 inch belt driven Troy extractor.
4 Old style Jackson winders.
3 40 spindle upright cop winders.
1 No. 35 Merrow small shell machine.
2 Industrial over-seamers.
1 Complete plant N. & T. underwear machines.
1 Plant of Leighton sweater machines.
1 Allen skein winder.
1 Payne 12-spindle skein winder.

WRITE FOR COMPLETE LIST.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.

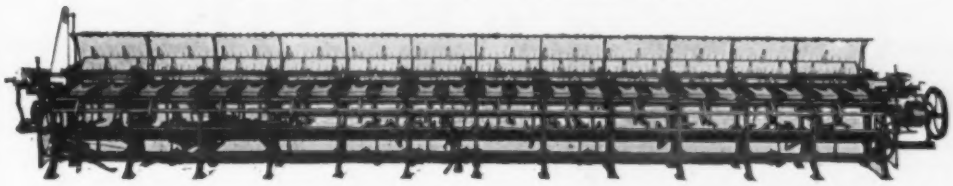
FULL-FASHIONED HOSIERY MACHINERY

.. BUILT BY ..

Chemnitzer Wirkwaaren-Maschinenfabrik

(Formerly SCHUBERT & SALZER)

CHEMNITZ, GERMANY.



HALF-HOSE LEGGER OF 24 SECTIONS.

All classes of flat work machines for full-fashioned hosiery in all gauges, from 21, 24, 27 up to 51 guage, from 12-24 sections, also machines for full-fashioned shirts and pants in all guages from 6-10 sections, with narrowing and widening.

Representative: OTTO WALTHER, 591 Bourse, PHILADELPHIA

Universal Cutter Co.

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FRED BAUMANN, Jr., Eastern Mgr., 467 Broadway, NEW YORK.

CUTTING MACHINES

Made to be operated by direct current, 110 or 220 volts.

What electric current have you?

UNIVERSAL CUTTER will do the work BETTER and cut a GREATER quantity of Knit Underwear, or Fleeced Materials, than any other Cutting Machine on the market. : : : :

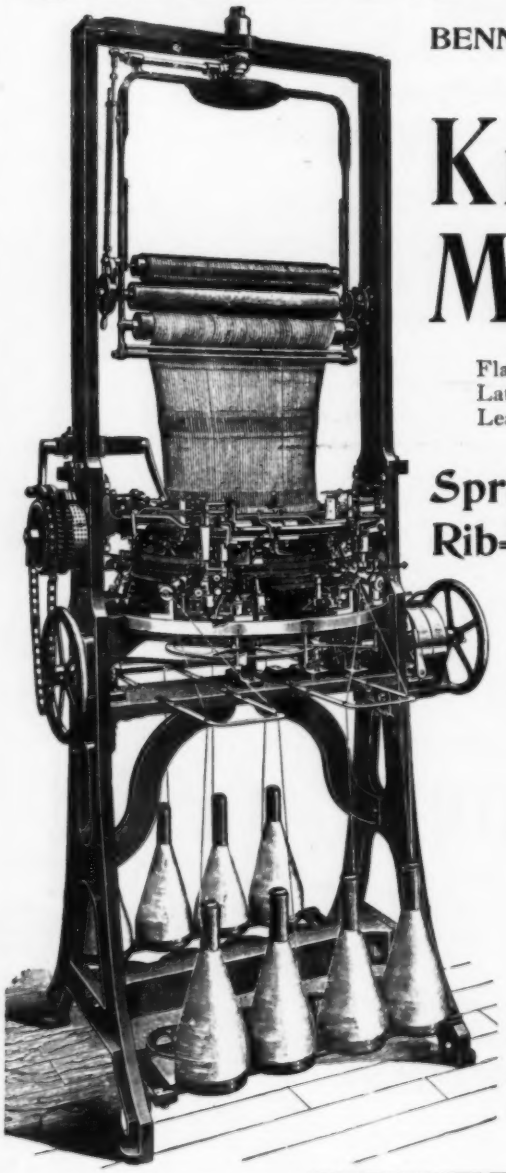
Made in 3 sizes Circular Knives:—Gem, 3 1-4 inch Knife, weight 15 lbs.; Prima, 4 inch Knife, weight 24 lbs.; Giant, 5 1-2 inch Knife, weight 27 lbs. Two sizes straight or Reciprocating Knives. Send us sample of material you desire to cut, stating thickness you want to cut at one time, and we will advise you as to which size is best adapted to your wants.

Charles Cooper

BENNINGTON, - VERMONT,

MANUFACTURER OF

Knitting Machinery



Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.

Spring and Latch Knitting Needles,

Burr Wheels, Burr Blades,

Sinkers, Jacks etc.

COLLARETTE ATTACHMENT.

Branch Shop, Amsterdam, N. Y.
Philadelphia Office, "The Bourse."
European Office, Manchester, Eng., 68 Deansgate Arcade.

S. J. SIBBALD, General Representative,
160 Sixth Ave., Upper Troy, N. Y.
Telephone No. 4325.

G. E. PARKER,
Traveling Representative,
Amsterdam, N. Y.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

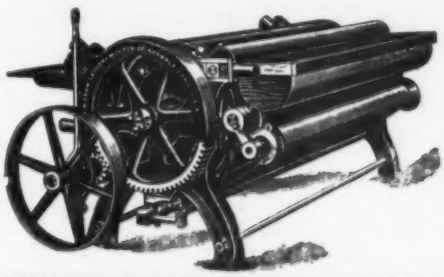
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,

SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,

N. W. Cor. Lehigh Ave. and Mascher Street,

PHILADELPHIA.

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

Hosiery Boards.

Irregular Form Cutting Machine

For Cutting Curved Drawer Bands, Pockets, Gussets, Fans, Etc. In fact almost any irregular shape can be cut on this machine, which is the only one of the kind made especially for this purpose.

Special Machines for Knitting Mills

Band Folding and Cutting Machines, Power Neck Marking and Shaping Machines, Hand and Power Cloth Cutters, Flat Rib Cutters, Folders and Winders, Loopers, Hot Roll Folders, Eyelet Machine, Irregular Form Cutting Machines. Also Full Line of Knitting Mill Suplies.

Send for Circulars.

THOMAS KENNEDY & SON,
Cohoes, N. Y.

WOLFGANG RICHTER,
Importer and Builder of

Full Fashioned Knitting Machinery

N. E. Corner Third and Green Streets,
PHILADELPHIA, PA.

Stanton & Lewis

CENTRAL STEAM FORGE

316 and 318 Florist St.,

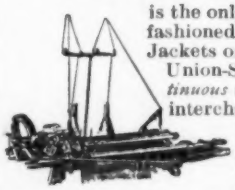
PHILADELPHIA .. .. PENN.

The best equipped shop in the United States for the Manufacture of

Knitting Machine Cylinder

and Sinker Bed Ring Forgings, from the smallest to 30 in. dia. of the best steel.

The Grosser PATENT FLAT KNITTING MACHINE



is the only reliable machine for full-fashioned Sweaters, Cardigan or Golf Jackets or Vests, Gloves, Underwear, Union-Suits, etc., that gives *continuous* satisfaction. All parts are interchangeable on our new style. The only automatic Machine for Jacquard Honey-Comb or Seamless Shaker Sweaters. We have the only first class High Speed 2 thread Lockstitch Overseamer for selvedged Knitgoods, that will sew in Sleeves or hem in double Bottoms on Sweaters without puckering. *ARTHUR MUELLER, 780 Madison St., Brooklyn, N. Y. Telephone 665a Bushwick*

Builders of
Steam Presses,
Oxidizers,
Chromers,
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STEAM PRESSES, HOSIERY-FINISHING AND DYE HOUSE MACHINERY.

F. H. Pownall IRON WORKS,

JAMESBURG, N.J.

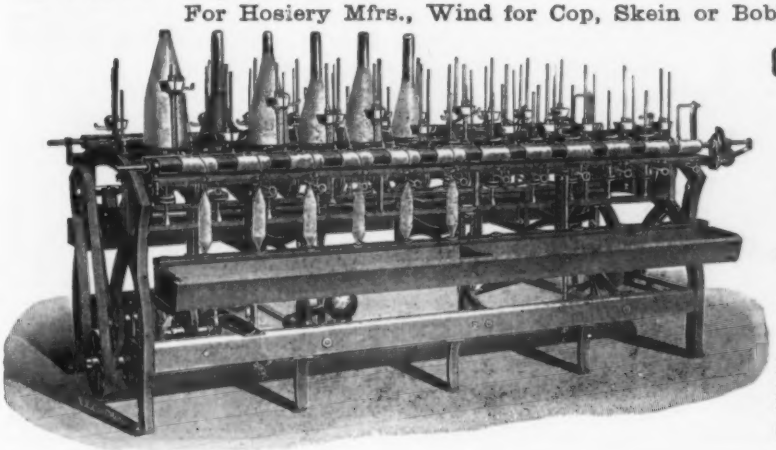
Hosiery and Laundry Dryers.

Complete Dye Plants Erected.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

WILLIAM R. DILLMORE, President. JOHN C. EGLY, Secretary and Treasurer.

KEYSTONE FULL AUTOMATIC KNITTER.

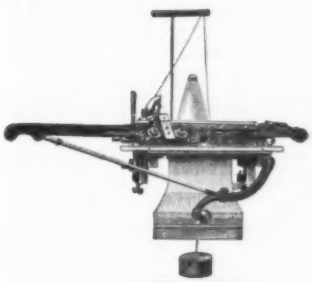
The simplest machine of the kind ever built. A small bench machine running with a 3-4 inch belt. Can be used with two cylinders, or transfer points if desired. Positive thread splice. All parts interchangeable. Call and see it in operation in our offices.

MANUFACTURERS OF LATCH NEEDLES

We can furnish you needles for any make of machine that you use. We number among our customers, the best known mills in this country. We will be pleased to estimate on any line.

KEYSTONE KNITTING MACHINE MFG. CO., 2600 North Sixth St,, Philadelphia, Pa.

SEYFERT & DONNER, CHEMNITZ, GERMANY.

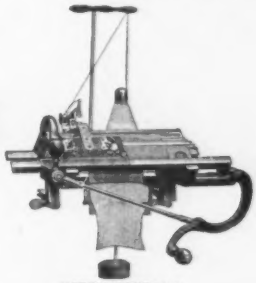


"TEUTONIA"

BUILDERS OF ALL KINDS OF

Flat Knitting Machines

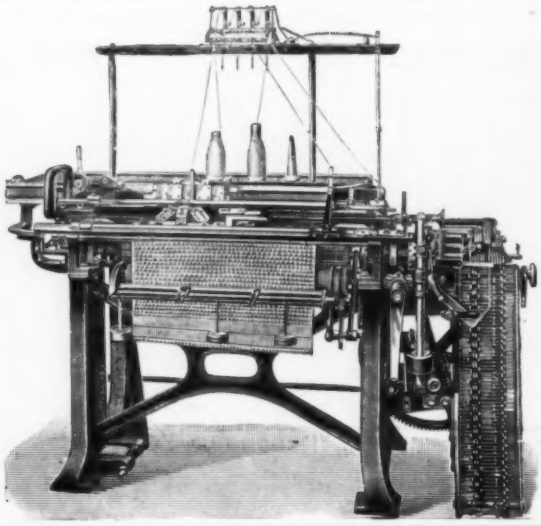
(LATCH NEEDLES.)



"HELVETIA"

More than thirty different Models of **Hand Knitting Machines.** Special Machinery for Fancy Gloves, Fronts of Cardigan Jackets, Golf Hose, Sweaters, etc., etc. **Patentees and Sole Makers of the "TEUTONIA" KNITTER** the very best hand-machine for the manufacture of plain, seamless hose and half hose with Griswold heel, narrowed leg and toe. **FULL AUTOMATIC POWER KNITTING MACHINES, Independent Heads,** for making Rib Tops, Sweaters in 1 and 1 and Half Cardigan Rib, 2 and 2 Ribbed Ladies' Vests, Scarfs, Shirt and Shaker Bodies, etc. **FULL AUTOMATIC FANCY JACQUARD KNITTING MACHINES, Power Motion. AUTOMATIC NARROWING MACHINES—Power Motion—3, 4, 6, 8, 10 heads** for making plain, seamless legs of Ladies' Hose (full fashioned), plain, fashioned seamless Pants and Sleeves, Ribbed Pants and Sleeves, Cardigan Jackets, Cardigan Sleeves (narrowed and widened), etc.

Sole Agent for the United States, JULIUS MULLER, 132 Melrose Street, Brooklyn, N.Y.
Reduction of Prices on Hand Machines of all kinds.



Full Automatic NOPPEN & JACQUARD MACHINE

For High-Grade Sweaters, Jerseys, Etc. in latest plain and colored patterns.

Most durable, simplest construction! Easy to operate and adjust! Recognized as the Best in the market. One operator attends to 3 of these machines! Only reliable machine for above articles.

HIGH SPEED! LARGE PRODUCTION!
IN USE EVERYWHERE!

CLAES & FLENTJE Mühlhausen, Thur, GERMANY.

Ask for samples and full particulars. State gauge and size you need.

Perfect Fast Black for Hosiery

The "Dubois' Sanitary" Oxidized Fast Black Dyeing Process with the Lisle Thread Silk Finish, Patented March 17, 1903, and The "Dubois Sanitary" One Dip Fast Black in Powder Form, Leads Them All!

This is the most reliable dyeing formula known to fast black dyers. It has been adopted successfully by many leading mills. It always gives uniform shade, oxidizes well and the fabric is almost as strong as though dyed with direct colors. Most important of all, it gives a fine lisle thread finish without in the least tendering the goods. Beware of cheap fast black formulas, which are sure to be dearer in the end.

The cost of the Dubois black, the best in the market, is very reasonable, as low as $1.40 per 100 pounds dyed in ordinary black for cheap trade, and not over $2.50 per 100 for the very best black for high grade goods, guaranteed to be ungreenable to acid tests and wear. Manufacturers of knit goods, hosiery and job dyers ***take notice*** that I am prepared to give licenses with full instructions for producing lisle thread finish (processes patented March, 1903) on any kind of direct colors or fast black, either before or after dyeing or bleaching.

Sulphur and diamine blacks particularly are so much improved after having been lisled by my patented process that they look just as well as aniline oxidized fast black, and yarn costing 17 1-2 cents per pound will produce as fine a looking fabric treated by my process as the genuine lisle thread at a cost of 34 cents per pound. This is a boon for direct color job dyers and bleachers, as well as for manufacturers of hosiery and knit goods.

The license will be given on a small royalty per 100 pounds.

All the machines used for the fast black and lisle thread finish, also for giving lisle thread finish to direct colors on bleached or unbleached goods are of my own invention, and are

PATENTED AS FOLLOWS:

June 18, 1901. Rotary oxidizing apparatus. The only machine in the world that carries the goods while oxidizing and lisling at all points of the compass. Quickest oxidizer known.

September 9, 1902. Rotary yarn oxidizing apparatus. Also carries the yarn at all points of the compass while in process of oxidizing or steaming.

June 10, 1902. A stationary hosiery oxidizing apparatus. Two different speeds. Especially constructed for lisle thread finish on hosiery or knit goods, equipped with an electric thermometer for the accurate measurement of the dry and wet hot air.

December 10, 1906. Stationary hosiery oxidizing apparatus. Two speeds. Chain and sprocket wheel drive with double clutch to start and stop. Very strong for heavy work, also built for lisle thread finish.

ALSO NOTICE:—That My One Dip Sanitary Fast Black in Powder Form is the same black as the Sanitary Oxidize Fast Black Process mentioned at the head of this advertisement, and is a long felt want among the trade, particularly for small concerns whose production would not warrant the equipping of an Oxidize Fast Black Dyeing plant.

This One Dip Sanitary Fast Black is dyed in the open ordinary dye tub at boiling heat in one hour, then washed and softened, if desired, as is done with all other direct colors for cotton hosiery, and has the advantage on the other direct blacks to allow the production of any shade desired from a jet to a very blue black, and matching well the oxidized aniline black.

The cost per 100 pounds hosiery dyed with this black is from $3.50 to $3.80 according to amount of softener used.

This One Dip Sanitary Black is positively guaranteed to be ungreenable to acid test and wear and leave the fabrics as strong after dyeing as it was in the white.

The apparatus required to start dyeing are but two ordinary wood dyer's tubs and one hydro-extractor.

Those wishing to put on their goods so dyed my "Lisle Thread Finish" (Patented) can do so by simply adding to above apparatus one or more of my "Stationary Oxidizing Machines" (Patented June 10, 1902), and take out a license for the use of my patent for lisle thread finish on vegetable fabrics, which will be given free of charge, and all you will have to pay for the use of the machine and the lisle thread finish process, will be but a small royalty for each 100 pounds hosiery given the lisle thread finish.

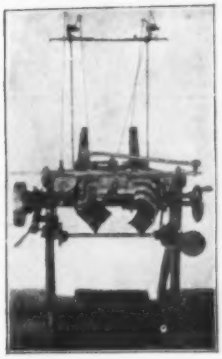
Dyers and manufacturers that are far away may procure a license with full instructions for building the machines economically, paying a small royalty for the use. I have made the royalties low, so that ***no one may be debarred by reason of the price,*** but I mean to protect my patents and will vigorously prosecute any who infringe.

Fast black dye and bleach plants for hosiery, underwear and skein fast black yarn dyeing, installed and equipped complete, if desired. Apply to

A. N. DUBOIS, 2170 Sedgeley Ave., Phila., Pa.

or

KEYSTONE LAW and PATENT CO., Betz Bldg., So. Broad and Market Sts., Phila., Pa.



Germantown Hosiery Machine Works

LINDLEY'S NEW AUTOMATIC POWER GLOVE FINGERING MACHINE

Germantown Skein Winder and Links for Double Ribs. Cardigan Jacket and Circular Knitting Machines for Shirts and Hosiery.

Cylinders and Dials of all kinds made and hardened. Special Machine and Jobbing Work promptly attended to. Also equipped to do general repairing of Platt's Cotton Spinning Machinery. Correspondence solicited.

GEO. W. LINDLEY, Prop. 5120 Wakefield Street, GERMANTOWN, PA.

DRYERS

Now is the time to fit your Drying Rooms.

We offer the cheapest and best Dryer ever offered to the trade.

Correspondence and Inspection Solicited.

We are also manufacturers of:—

Hydro-Extractor Guards,
Crimping Machines,
Neck Binders,
Table Legs, and
Gusset Cutting Machines.

Johnston Novelty & Mill Specialty Co.

No. 115 Genesee St., Utica, N. Y.

H. C. LONG, New England Sales Agent, Hartford. Ct.

National Spring-Beard Needle MACHINE

For Seamless Hosiery.

The only Machine on which the speed is advertised.

This Tells the Whole Story.

Best results guaranteed at 300 to 400 revolutions per minute, according to guage, hence the largest production by 25 to 40 per cent. over all other machines. Least cost for repairs, smallest needle breakage and lowest per cent. of menders. Full automatic, practical double-sole and high-heel splicer. Device for producing a great variety of lace effects, with no breakage of stitches and no infringement.

For full particulars, call or address

NATIONAL AUTOMATIC KNITTER CO.,

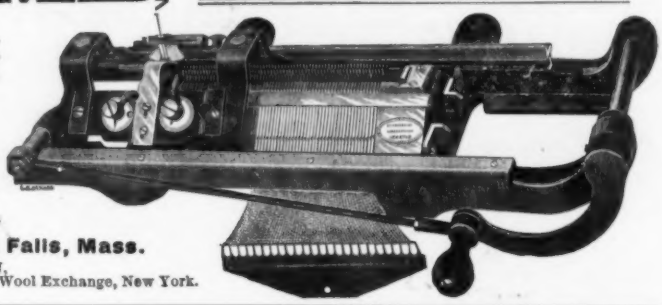
724, 726, 728 Cherry Street,
N. W. Cor. American & Diamond Streets,
PHILADELPHIA.

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.

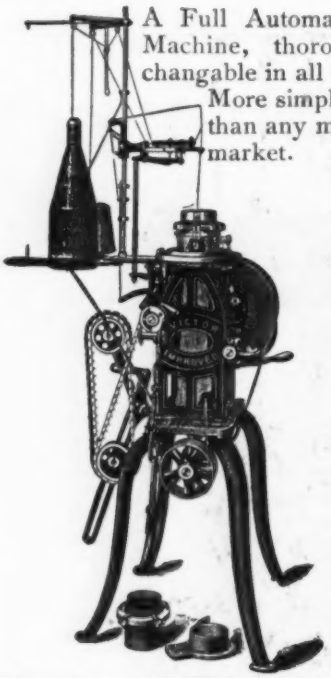


LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 505 Wool Exchange, New York.

The "New" Victor Knitting Machine



A Full Automatic Seamless Machine, thoroughly interchangable in all its parts.

More simply constructed than any machine on the market.

Full Automatic Two-Color Striping Machine

Full Automatic Combination Lace and Stripe Machine

American Knitting Machine Co.,

Office and Works:

Oxford Street, between Mascher and Hancock,

PHILADELPHIA, PA.

Standard Machine

Superior to All Others in Economy of Operation, Production and Fabric.

Best Built, Easiest Operated, Superior Fabric.

STANDARD B, Automatic Double Sole and all Improvements.

STANDARD C, the only Automatic Heel and Toe Changer.

STANDARD D, Automatic Striping Machine, none other in the market.

STANDARD MACHINE CO.

508 Ludlow St., PHILADELPHIA, PA.

Estimates Furnished for Complete Hosiery Plant.

L. T. IVES CO.

Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

PAGE NEEDLE CO.,

MANUFACTURERS OF

LATCH NEEDLES

of all kinds. Warranted in every respect.

CHICOPEE FALLS, MASS.

Agents: J. E. Woodhead, 100 Twenty-second Street, Chicago, Ill. Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York. James Taylor, 835 Arch Street, Philadelphia, Pa.

WM. BREEDON'S SON,

MANUFACTURERS OF

Spring Knitting Needles

AND BURR BLADES OF ALL KINDS.

AMSTERDAM, - N. Y.

ORION TREAT,

MANUFACTURER OF

Screw Riveted Balmoral and Double Rib NEEDLES

(Patented May 6, 1890.)

All Work Guaranteed. MANCHESTER GREEN, CONN.

WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles,

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

FREEMAN BROS.

Manufacturers of

Latch Needles

Harmony Block, BRATTLEBORO, VT.

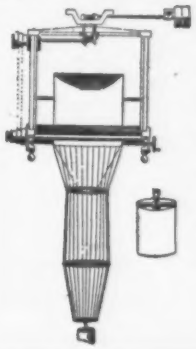
Manufacturers' Supplies Co.

418 ARCH STREET, PHILA.

Needles and Supplies for Knitting Mills.

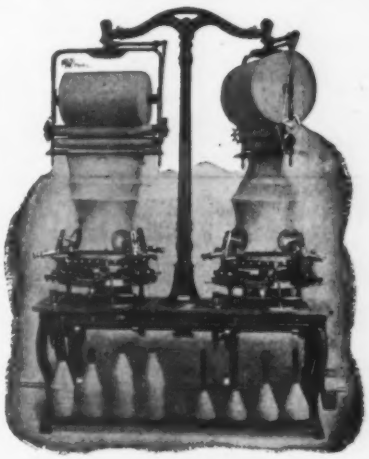
Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

NOT "JUST AS GOOD" BUT BETTER



WE acknowledge no equals with our Patent Improved Dryers. Perfect in Drying and Rolling there can be no better. Economy of room, saving in time, perfection of work, makes this Dryer stand without an equal. Acknowledged as such by competitors, who claim "just as good." Made and sold only by

E. M. ANTISDEL,
Utica, N. Y.



TOMPKINS BROS. CO., Troy, N. Y.
Knitters, Winders, Burrs, At n

EDWIN A. NEWTON,

KNITTING MILL MACHINERY AND SUPPLIES,

NEW AND SECOND HAND.

Exclusive Agent for the Hemphill Full Automatic Knitters.

245 Race St., Philadelphia, Pa.

Expert Appraisals on Machinery.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,

2124 to 2130 East York St., PHILADELPHIA, PA.

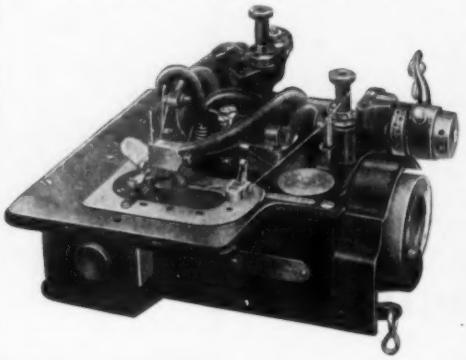
WILLCOX & GIBBS

"OVERLOCK" Machine.

(TRADE MARK.) (Pat. April 5, 1892.)

Patent twice upheld by the U. S. Court of Appeals.

For
Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery
in
ONE OPERATION
and for making
"Overlock" Corded Edge on Lace Curtains, Silks, Ribbons, etc.



WARNING!

Manufacturers and dealers are warned that not only is the "Overlock" Machine fully protected by patents, particularly our four patents of April 5, 1892; one of May 26, 1896 and one of August 11, 1903, but the edging products are also protected by patents of March 10, 1896, Dec. 26, 1899 and August 11, 1903.

Trade Mark Registered

Business Estab. in 1859

WILLCOX & GIBBS SEWING MACHINE COMPANY,

GENERAL OFFICES
TEMPORARILY AT
85, 87, 89 BLEECKER STREET,
CORNER MERCER STREET, **NEW YORK.**
BRANCHES: LONDON, PARIS, MILAN, DRESDEN.

Until completion of the New 12 Story Fireproof Building,
658 BROADWAY, Corner of Bond St.
THE OLD "WILLCOX & GIBBS" CORNER
where we were located for thirty-five years.

CELEBRATED BRAND PYRAMID **LACINGS**

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,
115 Franklin Street, NEW YORK.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

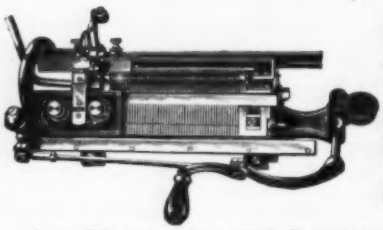
Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

Best Knitting Machines

IMPROVED CONSTRUCTION

For Hand and Power Driving.



High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

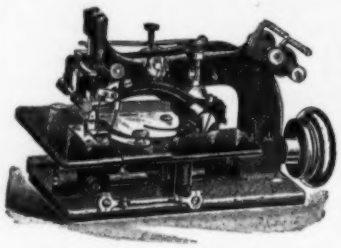
Everywhere in work. **80,000** Machines sold.

-CLAES & FLENTJE,
Muhlhausen, Thür, Germany.

—THE—

Champion Rib Knitting Machines

For HOSIERY AND UNDERWEAR



Also Sewing and Trimming Machines, Crochet and Shell Machines, and all other Machinery required in the finishing of Hosiery and Underwear. Complete Plants Installed.

Estimates Cheerfully Given.

Our New Overseaming Machine.

NATIONAL AUTOMATIC KNITTER CO.,
724, 726, 728 Cherry St.,
N. W. Cor. American and Diamond Sts.
PHILADELPHIA.

A. McMICHAEL,

Machinist,

Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

FINE MACHINE WORK.

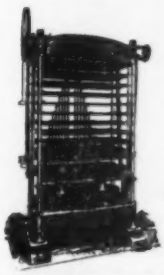
22 Armat Street, near Main, Germantown,

PHILADELPHIA, PA

We HARDEN all CYLINDERS and DIALS large and small.

The CRAWFORD

HOLLOW STEAM



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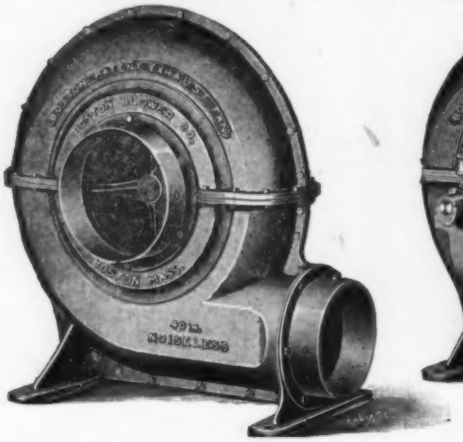
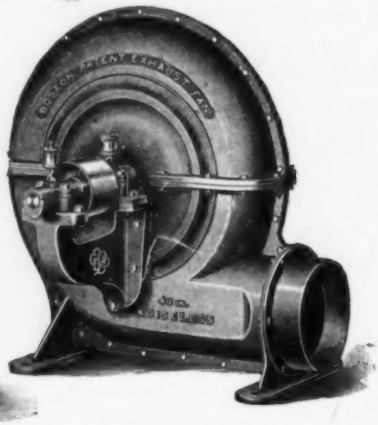


Inlet Side of Right-hand Wool Exhauster.



Pulley Side of Left-hand Wool Exhauster.

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

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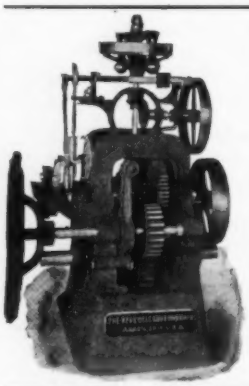

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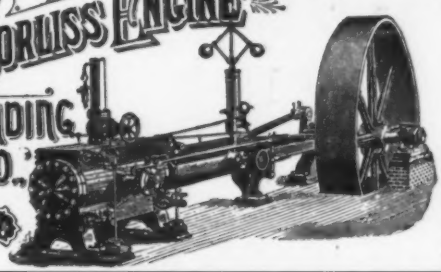

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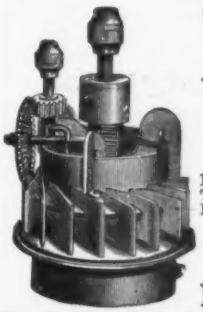

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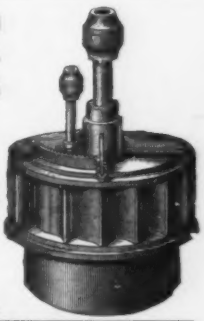

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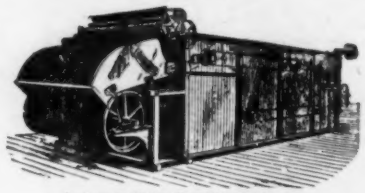
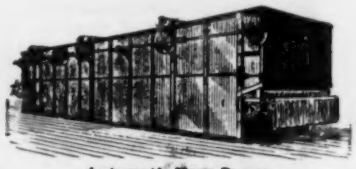


Automatic Cotton Stock Dryer.



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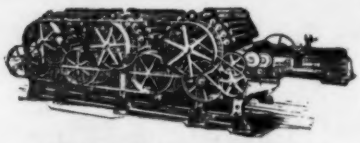

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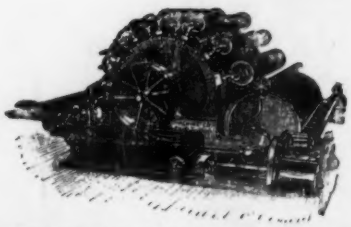

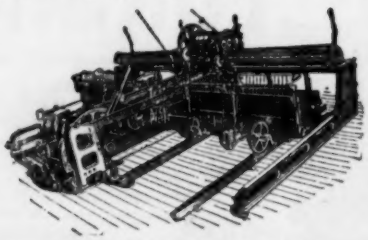

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Including Pickers, Cards, Mules, Twisters, Warpers, Dressers, Spoolers, Etc.

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"In spinning the high numbers which we make, we really do not see how we could get along without your system. It is certainly well worth the money it cost, and we regard the investment which we have made in this system a very profitable one."

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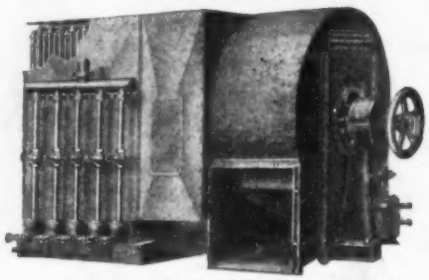
FOR MORE COMPLETE LINE SEE PAGE 59.



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